Improved Performance Research Integration Tool (IMPRINT)

Basic Tutorial

DRAFT

US Army Research Laboratory
Human Research and Engineering Directorate

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Introduction

This tutorial has been created to assist first time users, especially those who are not able to attend a workshop. This tutorial assumes that you have used Window applications before and know how to get around your computer. Although the workshop is more comprehensive, we hope this tutorial will help get you started. However, if you should run into any problems do not hesitate to contact us. Please contact Ms. Celine Richer – 410-278-5883 or e-mail: cricher@arl.army.mil.

The tutorial is divided into several sections.

- Define System Mission
- Stressors & Performance Shaping Functions
- Define Soldier
- Define Equipment
- Define Supply
- Workload
- Sharing Your Analysis
- Using Library Data
- Network Tool Bar
- Decision Symbols
- PTS Impact on Tasks
- Mapping Workload to Taxons
- Define Equipment Exercise Data sheet
- Library Systems

Stressors & Performance Shaping Functions are used in conjunction with either Define System Mission and/or Define Equipment (in this tutorial we use them with Define System Mission).

Define Supply is used in conjunction with Define Equipment.

Define Soldier is used with both Define System Mission and Define Equipment and can be used alone.

Workload is used in conjunction with Define System Mission.

Using Library Data, Network Tool Bar, Decision Symbols, PTS Impact on Tasks, Mapping Workload to Taxons, Define Exercise Data and Library Systems are references.

- Using Library Data explains how to use one of IMPRINT's existing library models.

- The Network Tool Bar and Decision Symbols sections both explain the different icons/symbols you will see and use in IMPRINT.
- PTS Impact on Tasks shows which taxons are impacted
- Mapping Workload to Taxons shows how IMPRINT converts any VACP Workload assignments you have made for your tasks into Taxon assignments. .
- Define Equipment Exercise Data sheet is used during the Define Equipment section of this tutorial.
- The Library Systems section is a table of analyses within IMPRINT, which can be used as a starting point.

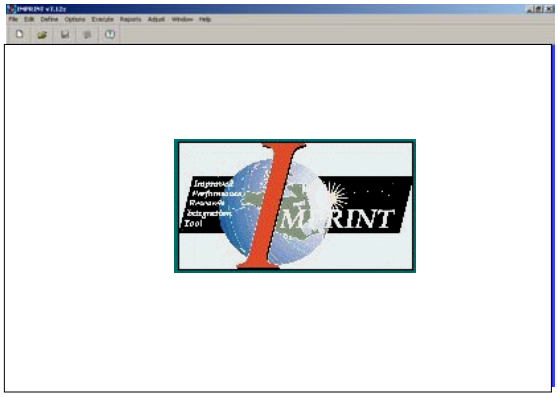
This tutorial is meant to be an aid and cannot answer all your questions. It is meant to be used in conjunction with the Users Guide and the Analysis Guide. You will find both in your "Documentation" folder under your "imprint7" folder.

If you have any suggestions regarding this tutorial or any problems using it please let us know. We want to make this a useful tool that will help you to use IMPRINT effectively.

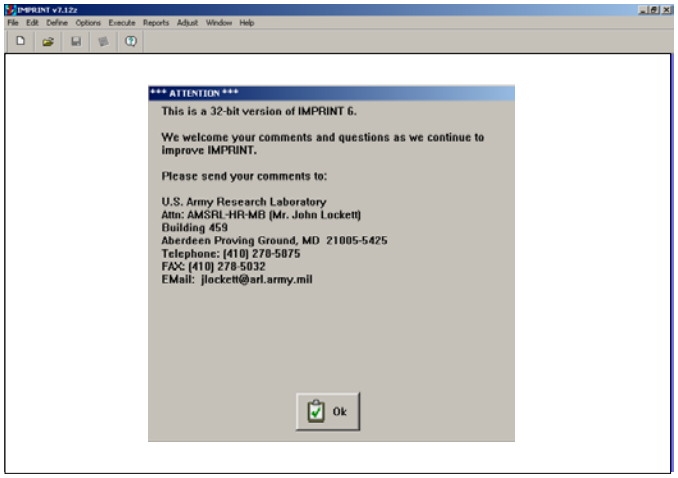
Happy IMPRINTing…… 

Starting IMPRINT

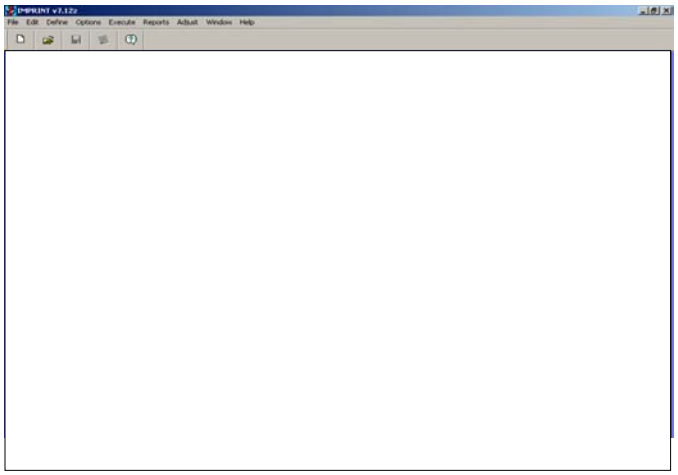
To start IMPRINT go to Start/Programs/IMPRINT 7.0
Whenever you start IMPRINT you will see the following screen.



Next, you will see the following message screen.



Select OK and you will then see the Main screen. It is blank…..



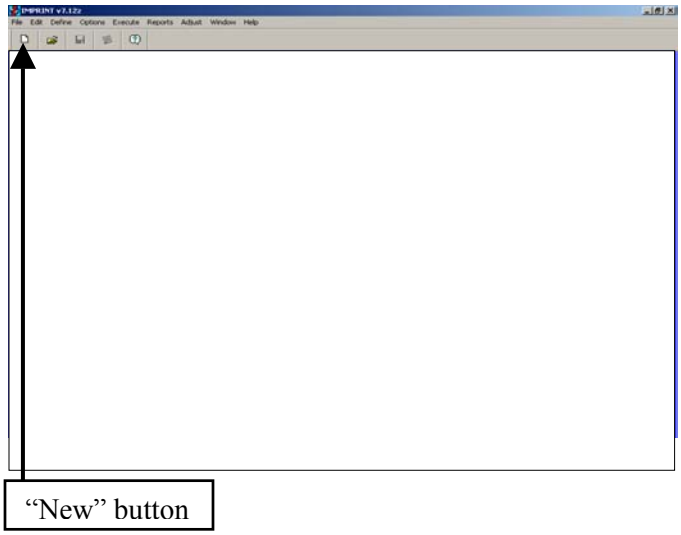
At this point, you can either create a new analysis or modify an existing one.

Define System Mission Exercise

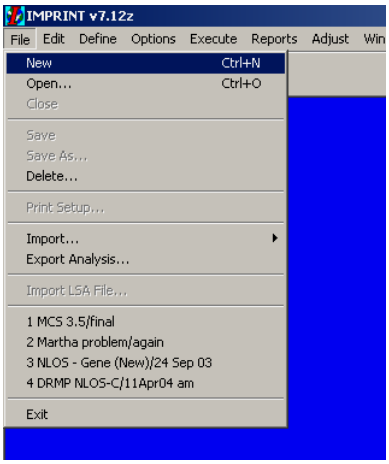
In this section, you will go through the steps to create a new system mission. For this exercise you will create a VACP model. VACP stands for **V**isual/**A**uditory/**C**ognitive/**P**sychomotor. You will learn how to create a new analysis, open an existing analysis, save your analysis, and also execute the model you create. You will also learn how to look at reports generated by the executed model and save them. For more information on VACP models see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

Let's start by creating a new analysis.

Creating a New Analysis

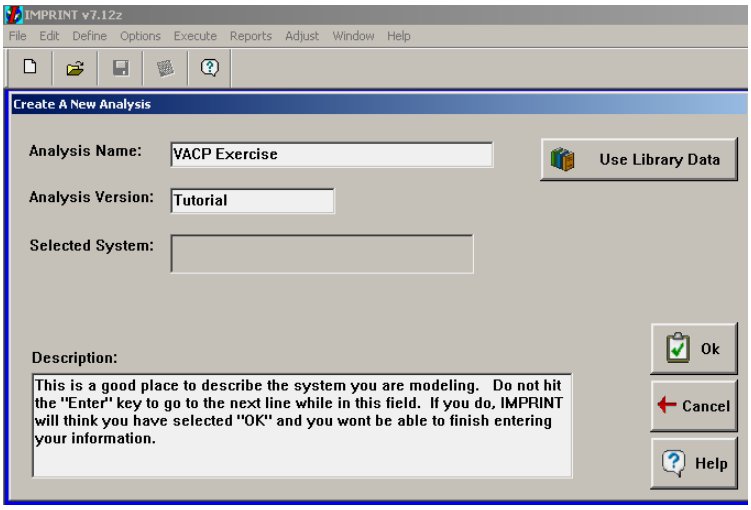


Create a new analysis by either selecting the "New" button as shown above or "File/New" from the menu as shown below



Define System Mission Exercise

On the Create A New Analysis screen -
Enter the "Analysis Name" and "Analysis Version".

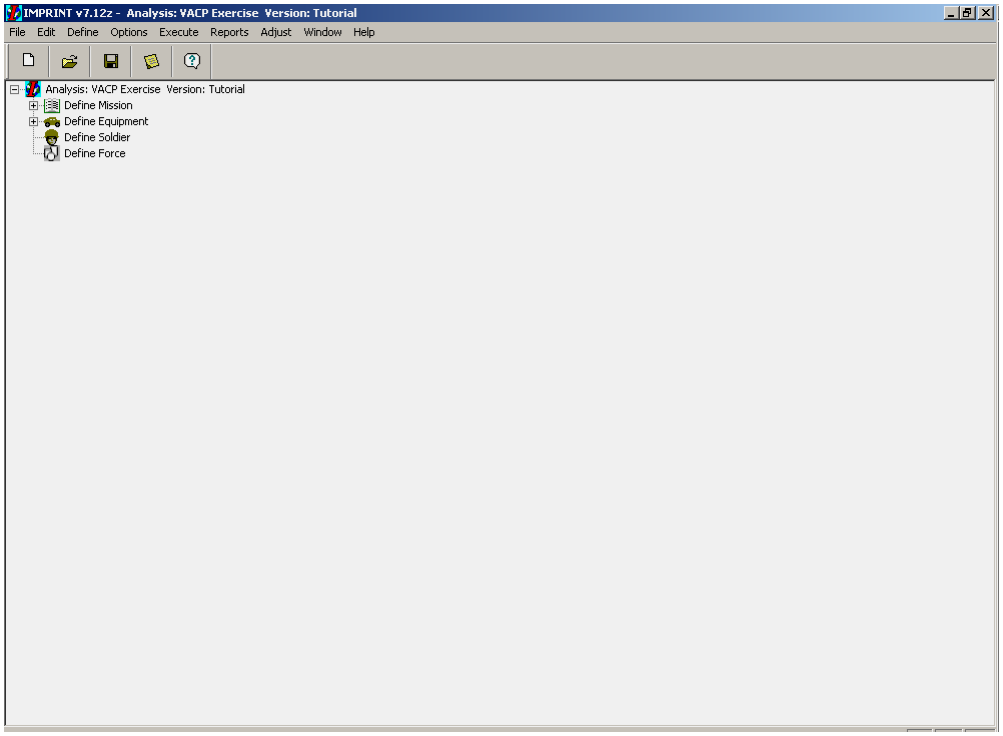


Analysis Name:= **VACP Exercise**
Analysis Version: = **Tutorial**

If you want to make some notes, you can enter information in the "Description" field.
When finished select "OK".
Now you are ready to make your modifications.

******Note:*** If you need to model a system that is similar to one of IMPRINT's library models see "**Using Library Data**" (page 104) at the end of this tutorial.

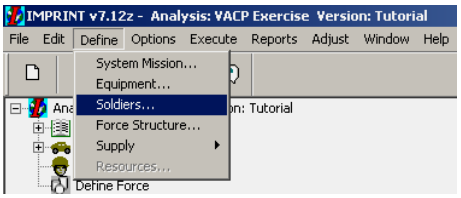
After selecting "OK" you will see the Main screen. In addition to the "IMPRINT v" #, the title bar above the main menu after will also contain the analysis name and the analysis version of the opened analysis. In this case you will see "Analysis: VACP Exercise Version: Tutorial". You will also see an hierarchical tree view showing all the data elements in the analysis on the Main screen.



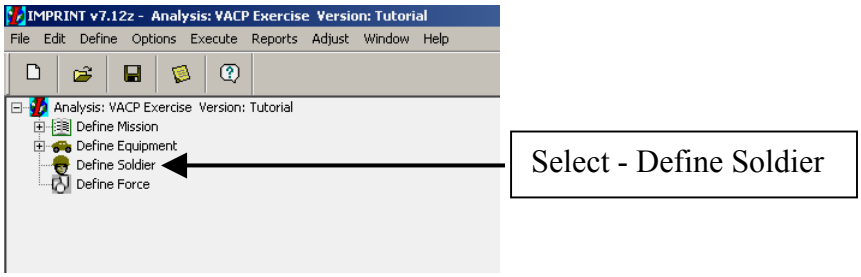
Define System Mission Exercise

Select "Define/Soldiers…" from the menu bar.

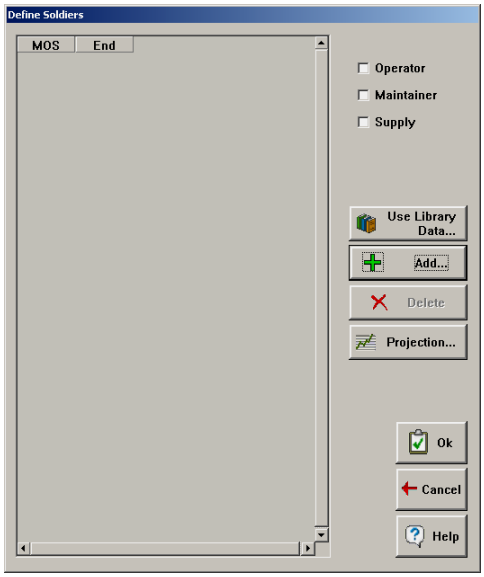
***Note:** This is not necessary. If you do not select a MOS(s) for your operator(s), IMPRINT will assign default MOS 00A. However if you need to apply Personnel Characteristics and you have not assigned a MOS(s) to your operator(s), you will need to come back to your mission and assign them. For this tutorial you will need MOS assignments when you do the **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors (PTS Option) section.



OR - you can select "Define Soldier" from the hierarchical tree on the Main screen

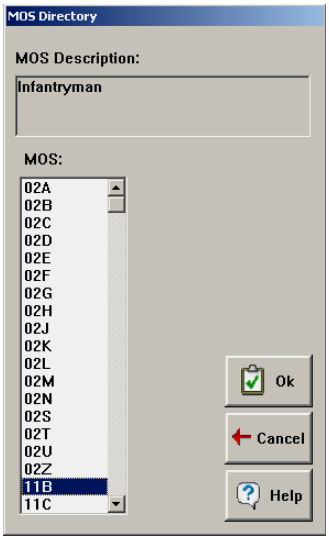


You will see the following screen –



Select "Add…"

Define System Mission Exercise



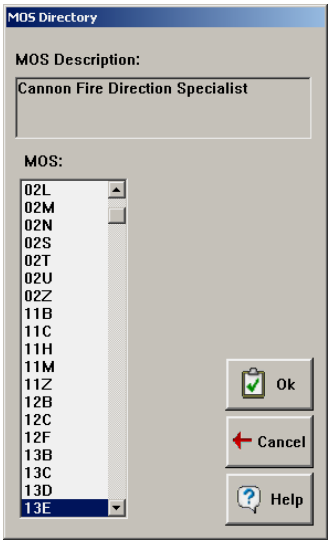
Select MOS **11B** from MOS Directory
Select "OK"

IMPRINT will automatically select "Operator"

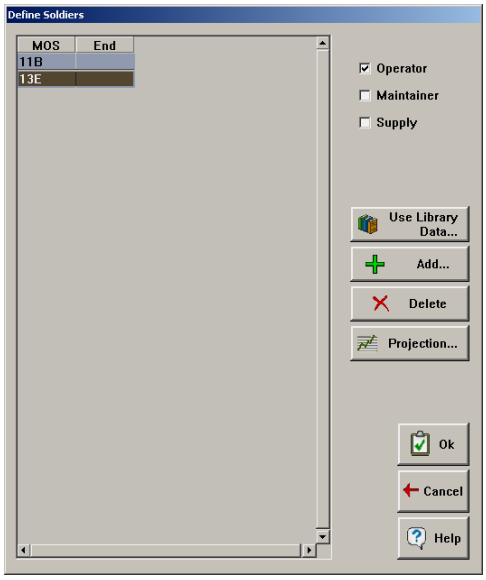
If you had selected an MOS designated as a Maintainer on the MOS Directory screen, then IMPRINT would have selected Maintainer on the Define Soldier screen. There may be cases when the Operator and Maintainer will be the same person. If that were the case, then you as the analyst may select a Maintainer on the Define Soldier screen. IMPRINT would automatically select "Maintainer" on the Define Soldiers screen and you would select "Operator". This would allow you to use the same MOS on the operator and maintainer side of IMPRINT.

Select "Add…" again.

Define System Mission Exercise



Select the second MOS (**13E**)
Select "OK"



IMPRINT will automatically select "Operator"

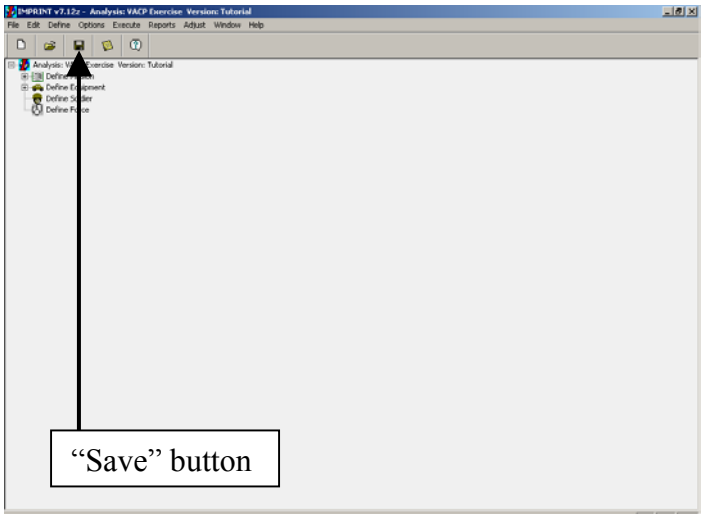
To save your selections, select "OK" on the Define Soldiers screen.

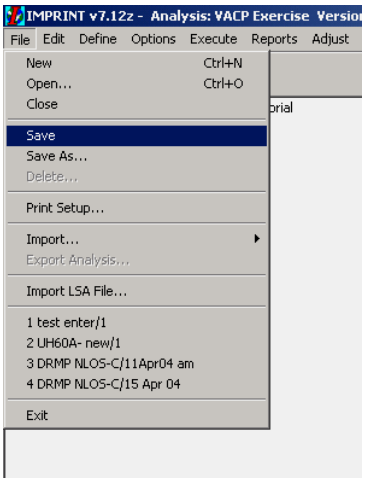
Now you are back to the Main screen

Define System Mission Exercise

Saving your work

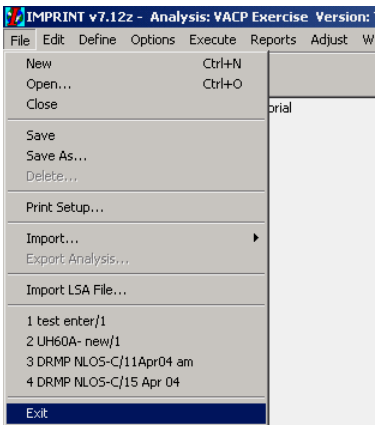
To save your analysis -
Select the "Save" button OR select "File/Save" from the menu bar





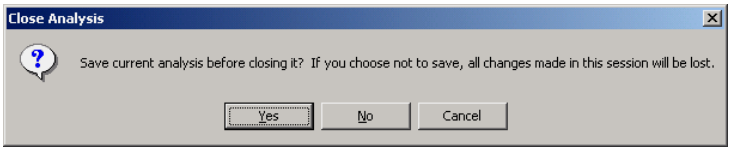
This will save what you have done so far. It's a good idea to save your work every so often. In this exercise you will exit IMPRINT and then go back and open the analysis. Normally after saving you would continue to the next step in creating/modifying your analysis.

Exit IMPRINT by selecting "File/Exit" from the menu.



Even though you just saved you will see the Close Analysis screen asking you if you want to save the changes you made.

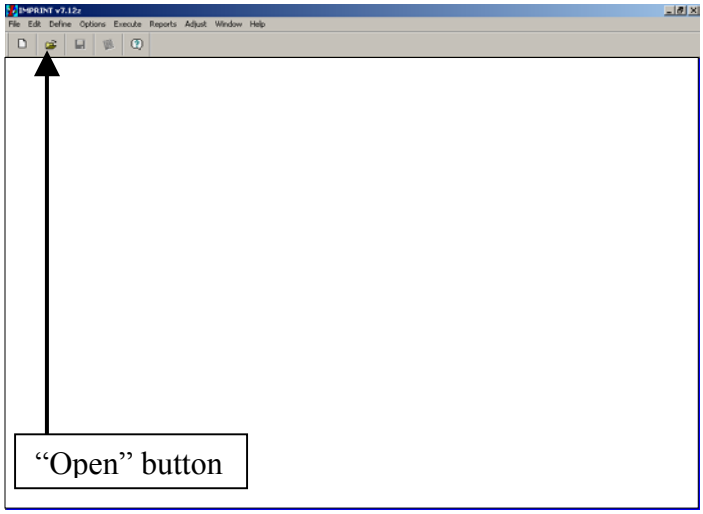
Select "Yes" and IMPRINT will close.

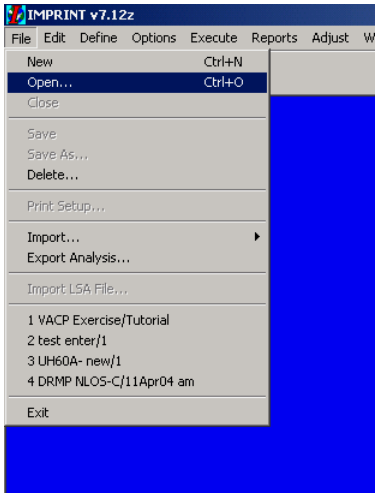


Start IMPRINT and open your analysis.

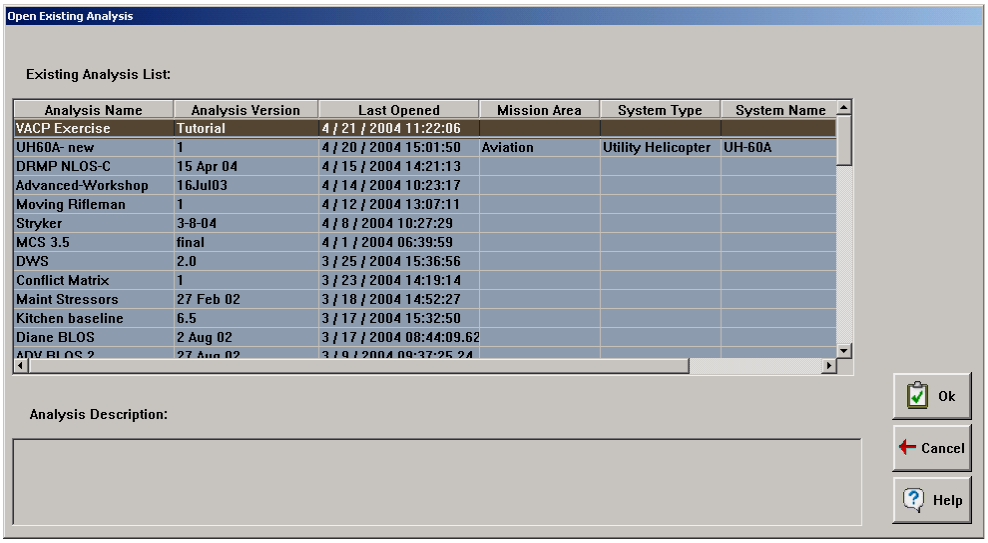
Open an Existing Analysis

You can use the "Open" button  OR select "File/Open…" from the menu bar.



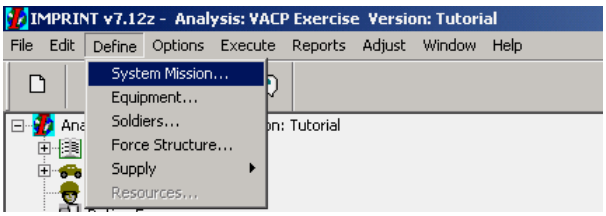


You will see the Open Existing Analysis screen. Highlight the analysis you want to open and select "OK". This will open your analysis

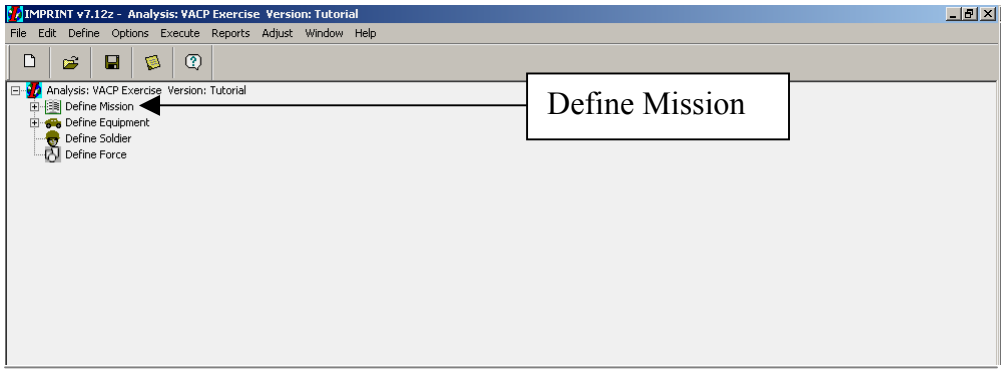


Define System Mission Exercise

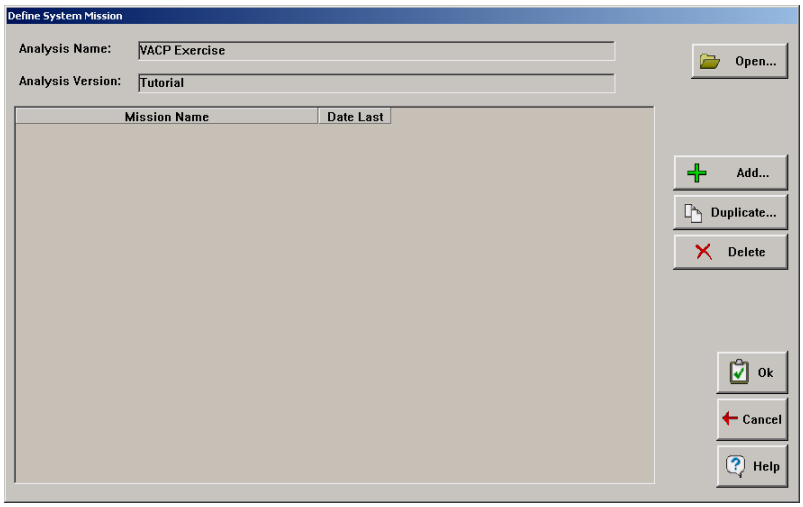
Select “Define/System Mission…” from the menu.



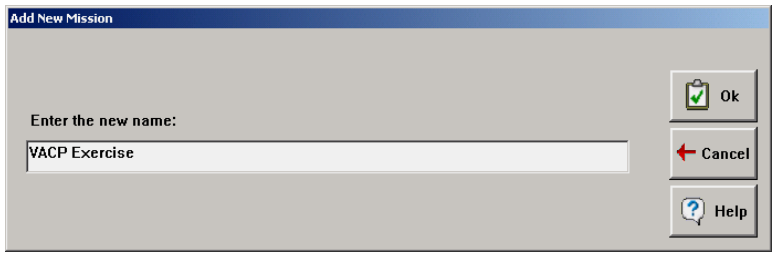
Or select “Define Mission” using the hierarchical tree



Select “Add…”



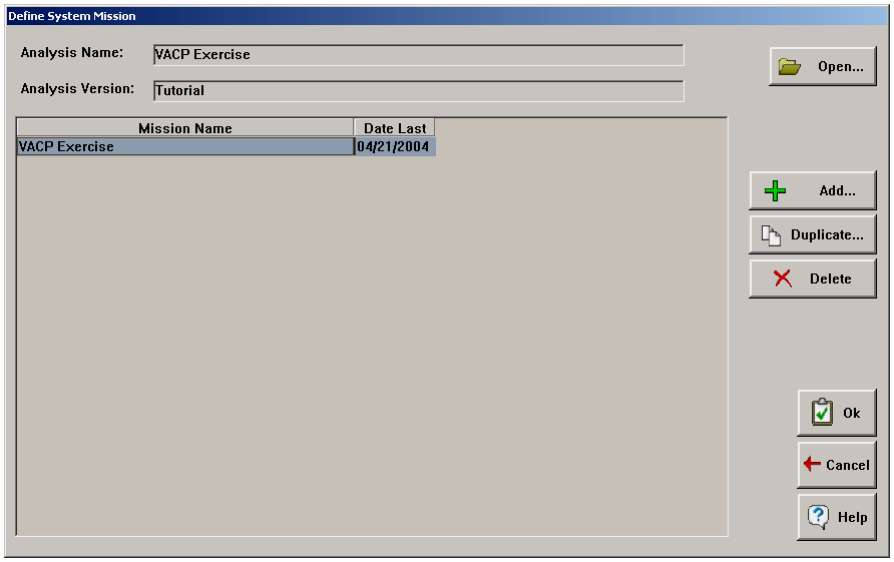
Enter the “Mission Name”.



Mission Name = **VACP Exercise**
Select “OK”

Define System Mission Exercise

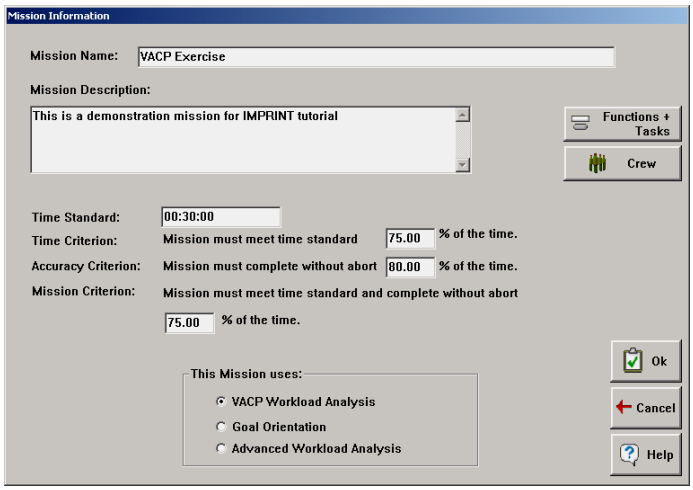
Select "Open" – This will open your mission.



******Note:*** The "Mission Name" will now appear in the title bar along with the name and version of the open analysis.

On the Mission Information screen - enter the mission description and mission data.

******Note:*** The time format generally used in IMPRINT is **HH:MM:SS.dd**



Mission Description = **This is a demonstration for IMPRINT tutorial**

Time Standard = **00:30:00.00**

Time Criterion = **75.00**

Accuracy Criterion = **80.00**

Mission Criterion = **75.00**

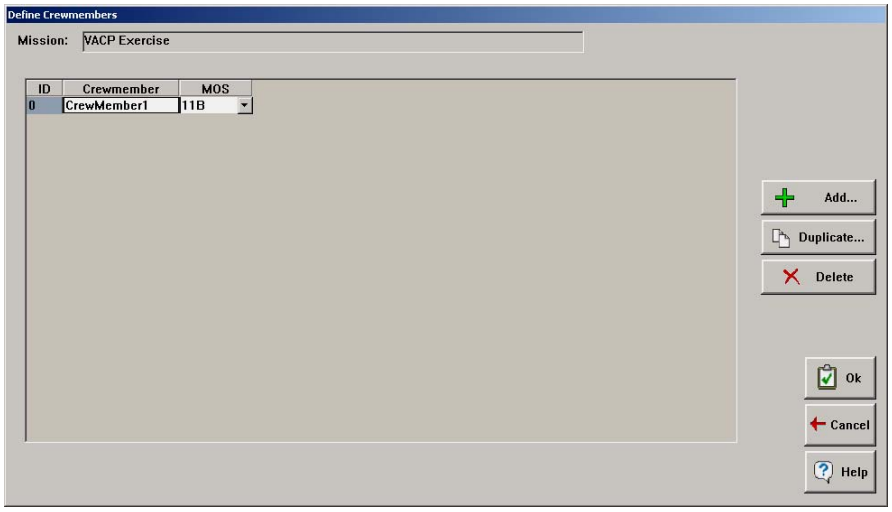
******Note:*** You don't need this information to execute your analysis. However, if you make changes to your model and want to compare the overall results of a new mission with this one, the results can be compared to the standards and criteria you enter here. In the "Mission Summary" report, you will see a summary of how often the standards and criteria were met.

At the beginning of this exercise, we said this would be a VACP model. When you create an analysis, the default is always "VACP Workload Analysis". You must select the other two options ("Goal Orientation", "Advanced Workload Analysis"). Neither of these options is covered in this tutorial. For an explanation of these options, see the IMPRINT Users Guide.

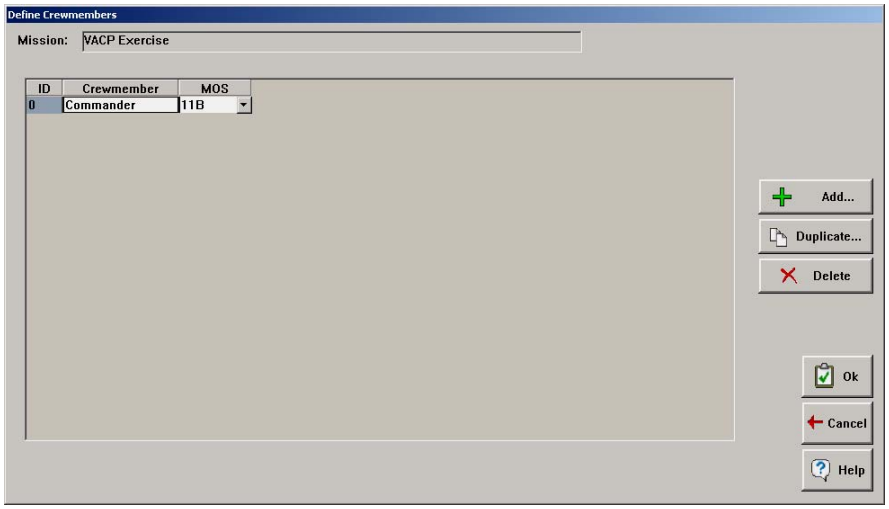
Define System Mission Exercise

When finished entering the information on this screen, you will enter the crewmembers (operators) for your model.

Select "Crew" to add crewmembers. You will see a default crewmember. To change the default name, click in the box and use the "Backspace" to delete. Enter the new name.

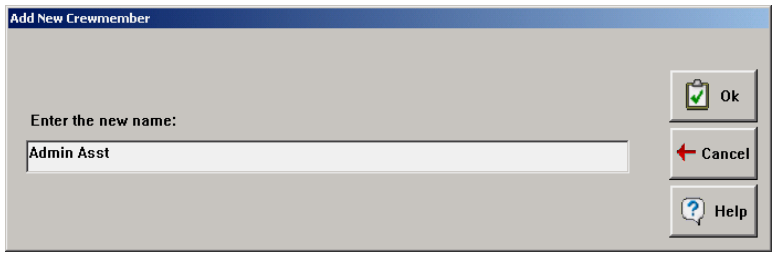


Type in – **Commander**



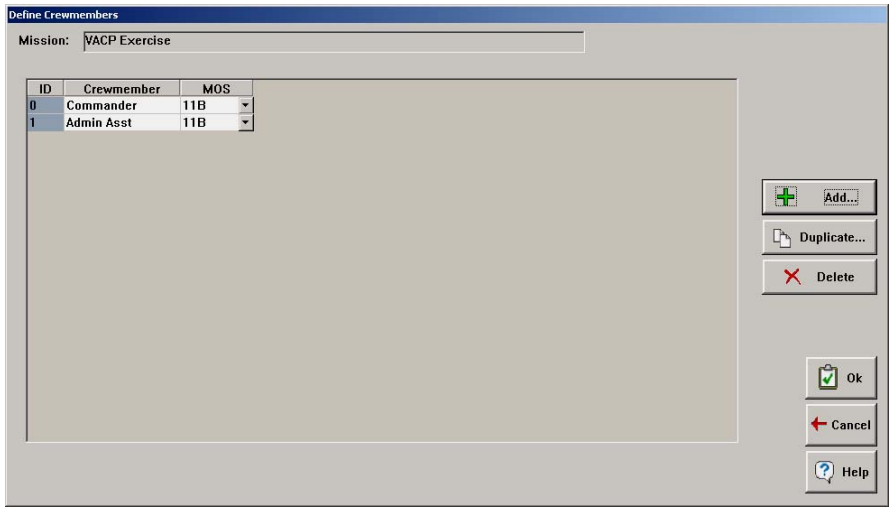
MOS – **11B** is the first MOS on the list and is the default.

To add the other 2 crewmembers select "Add…".



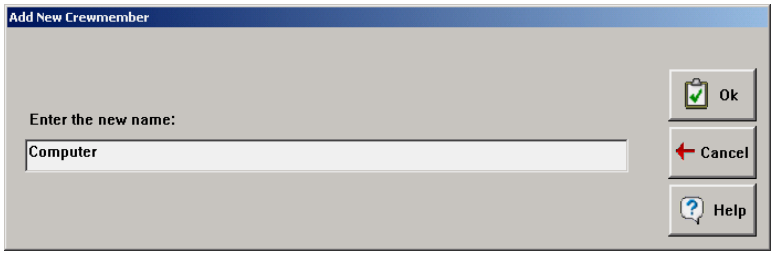
Enter – **Admin Asst**, select "OK".

Define System Mission Exercise

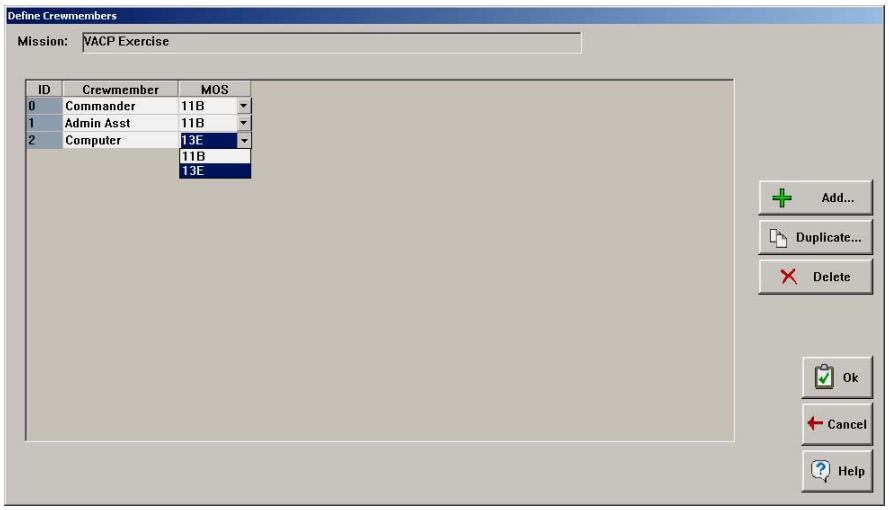


MOS – **11B** is the default

Select "Add" again and enter the last crewmember



Enter – **Computer**, select "OK".

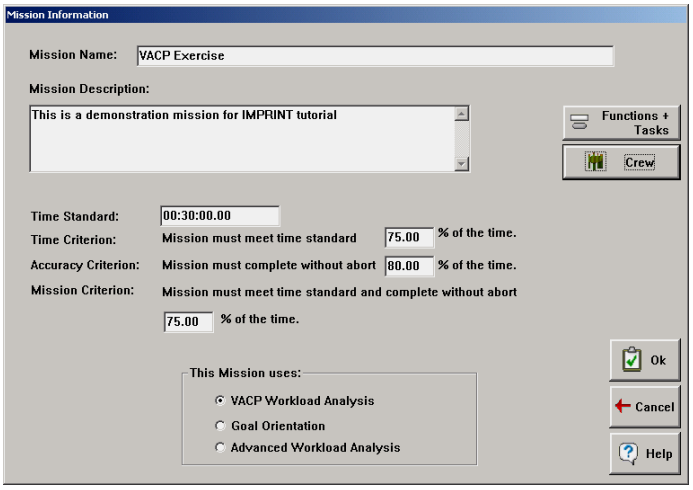


Select MOS – **13E**

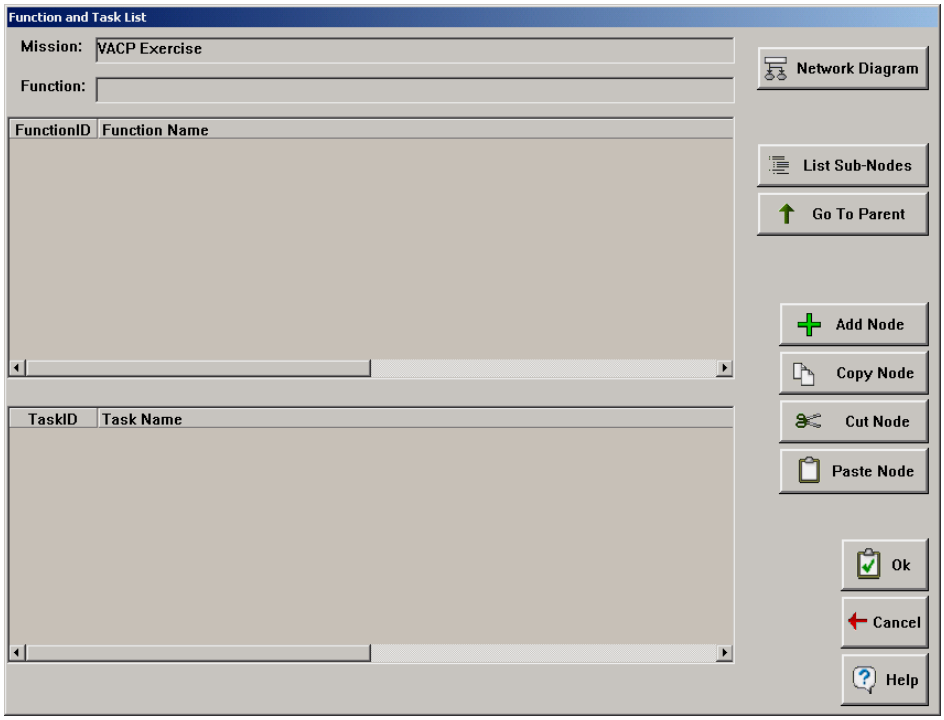
After you have entered all 3 crewmembers select "OK". This will take you back to the Mission Information screen

Define System Mission Exercise

On the Mission Information screen, select – "Functions+Task".



On the Function and Task List screen select – "Network Diagram"



Creating the Network Diagram.

To create the network diagram you will use several tools. You will use the:

"Function"  tool to add functions and the "Task"  tool to add tasks.

"Select"  tool to move the nodes, double click on nodes to open them, and manipulate the horizontal and vertical scroll bar.

"Path"  tool to draw your paths. To draw your path, click in the center of the function or task where the path will originate. Hold the mouse button down and drag to the center of the function where the path will end and release the mouse button.

If you draw a path to the wrong node use the "Undo"  tool to undo your path. Use it as you would the "Path" tool. Retrace the incorrect path and then use the "Path" tool to draw the correct one.

Whenever you draw a path to more than one node you will get a "Probabilistic"  symbol.

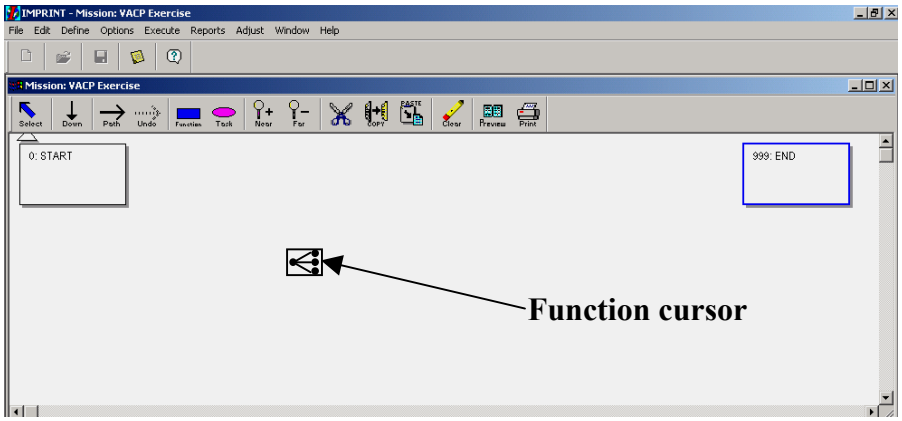
For more information on the other Network tools and symbols see the "**Network Tool Bar**"(page 106) and "**Decision Symbols**" (page 108) sections at the end of this tutorial.

Function Network

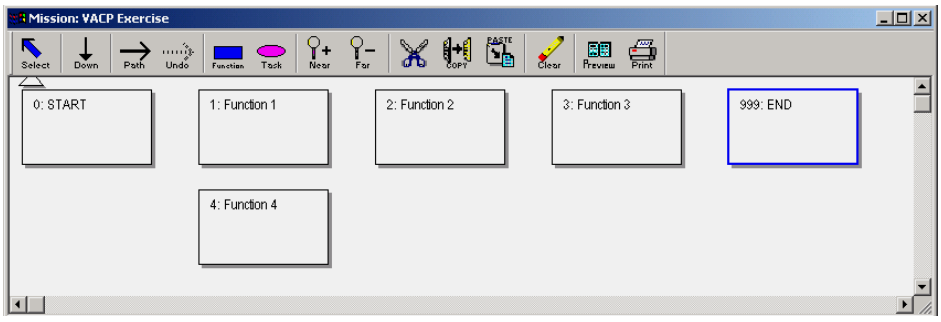
Let's begin creating the network at the function level.
Before you begin adding your functions, use the "Select" tool, click and hold on the "END" node and move it to the opposite side of the network screen to allow 4 functions to fit between the "START" and "END" nodes. This is not necessary. We are doing it here for clarity.

******Note:*** Functions/Tasks are placed in closest empty spot to the cursor.

To use the Function tool, click on the function symbol. Your cursor will change to the shape of the function tool.



Create the 4 functions by clicking in the network box where you want the functions to be. If you don't like where you have placed a function, use the "Select" tool to move it.



Define System Mission Exercise

Now begin drawing your paths.

Select the "Path"  tool. Notice that your cursor now changes and looks like an arrow. (⟶)

Connect START to Function 1

To draw a path from one node to another in this case from START to Function 1 do the following:
Hold your left mouse button down and begin in the center of the node you are coming from -in this case the START function and drag your arrow cursor to the center of the node you are going to – in this case Function 1 and release the mouse button. If you did this correctly you will see a line drawn from START to Function 1 with the arrow pointing to Function 1.

Now using the same procedure, connect the others.

Connect START to Function 4

Connect Function 1 to Function 2

Connect Function 2 to Function 3

Connect Function 3 to END

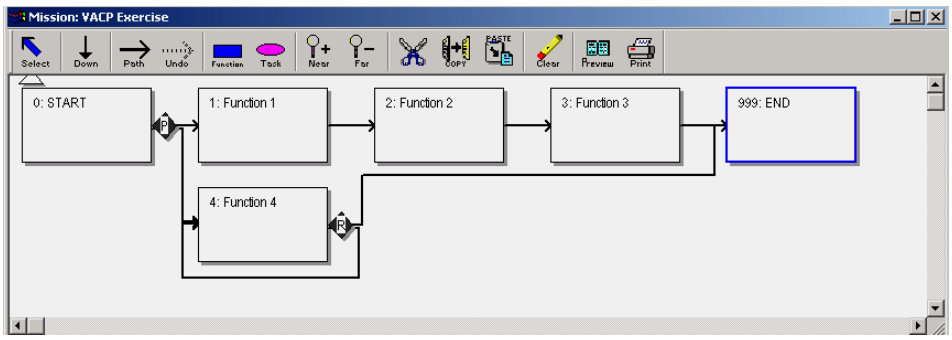
Connect Function 4 to END

Function 4 will be repeated during this mission. Therefore make it a repeat function:

Use the path tool and place your cursor inside Function 4. Now click inside Function 4.
This will draw the path back to node Function 4.

If you draw the path to the wrong node use the "Undo"  tool to undo your path. To erase the path, use it as you would the "Path" tool. Retrace the incorrect path and then use the "Path" tool to draw the correct one.

When you are finished your network should look like the one below.



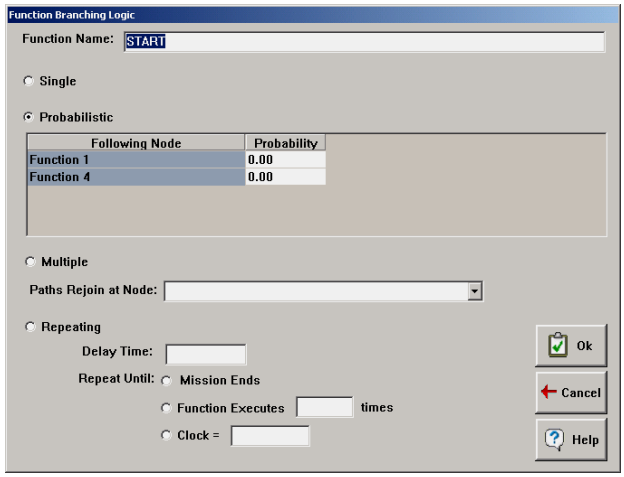
When you connect START to Function 1 and to Function 4 you will see the "Probabilistic"  symbol. In this exercise, this is intended to be a "Multiple" node because both functions Function 1 and Function 4 will begin to execute simultaneously and then rejoin at "END".

Using the "Select" tool, double click on the "Probabilistic" symbol coming from the START node.

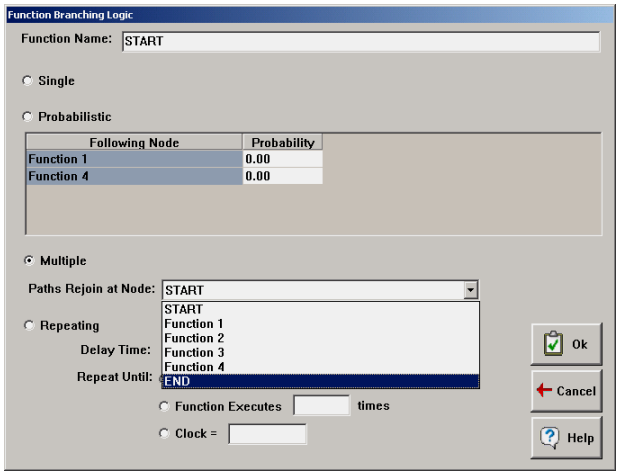
******Note:*** The "Select" tool can be used on all Functions, Tasks, and Decision nodes to enter or change other characteristics of that node. This is accomplished by double clicking.

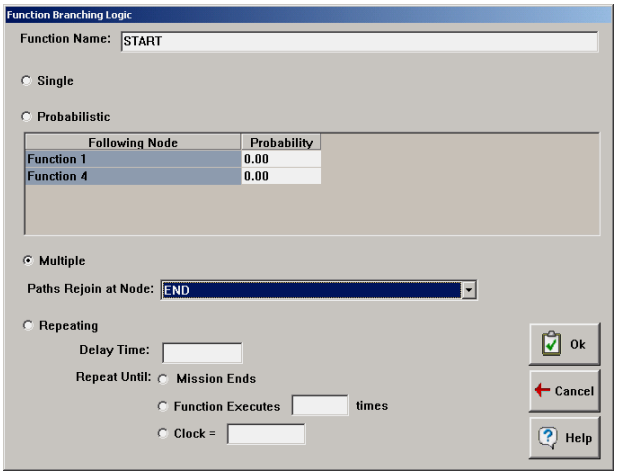
Define System Mission Exercise

You should see this:

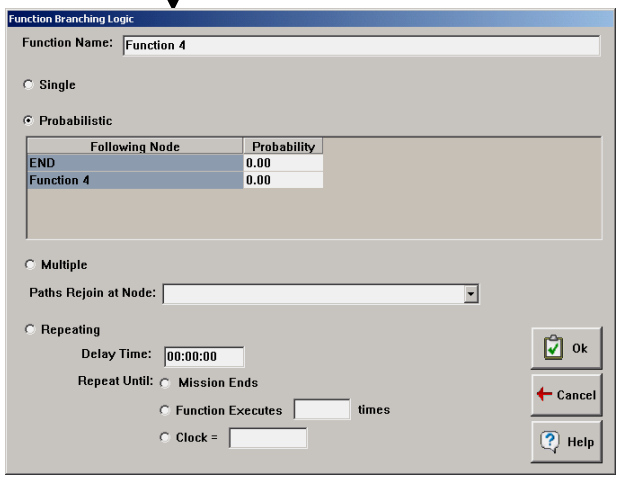


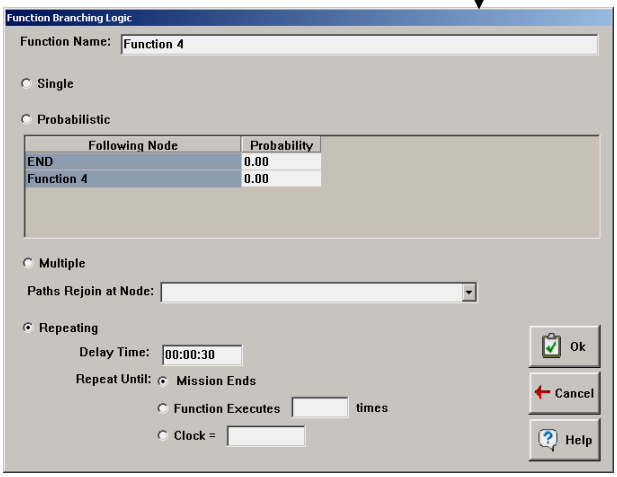
Select "Multiple" and using the drop down box select the END node. Select "OK".





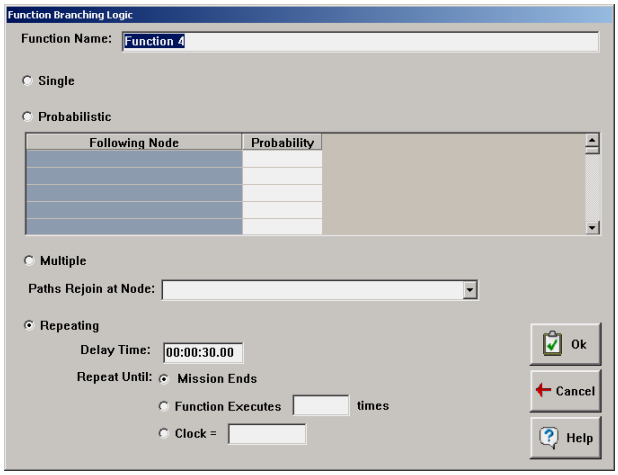
Function 4 is a "Repeating" (R) function. Depending on how you drew your paths it may have a "Probabilistic" symbol. Double click on the (P) or (R) symbol. If the symbol is "Probabilistic" you will see this screen. Select "Repeating" and then enter the "Delay Time" as shown on this screen.





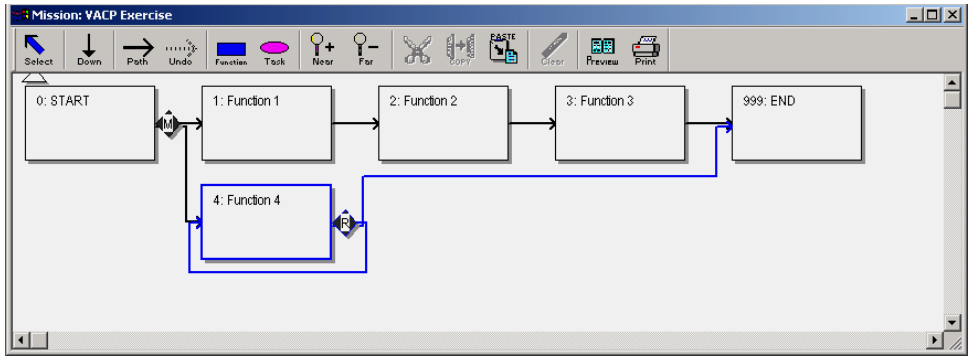
Define System Mission Exercise

If the symbol is Repeating  then you will see this screen. In either case – when this function begins it will have a delay of 30 seconds and will continue to execute until the mission ends.



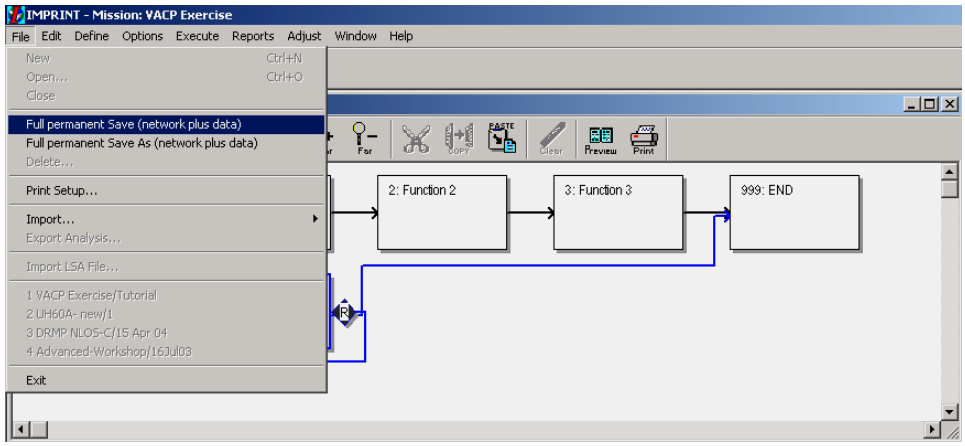
Delay Time = **00:00:30.00**
"Repeat Until" - **Mission Ends**.
Select "OK".

Your network diagram should now look like this:



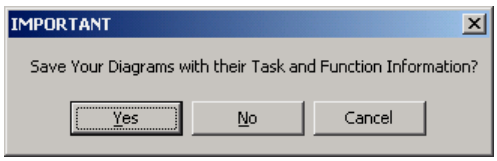
Now would be a good time to save your work.

Select "File/Full Permanent Save (network plus data)" from the main menu.



You will see a dialog box asking if you want save your diagram with their task and function information.

Define System Mission Exercise



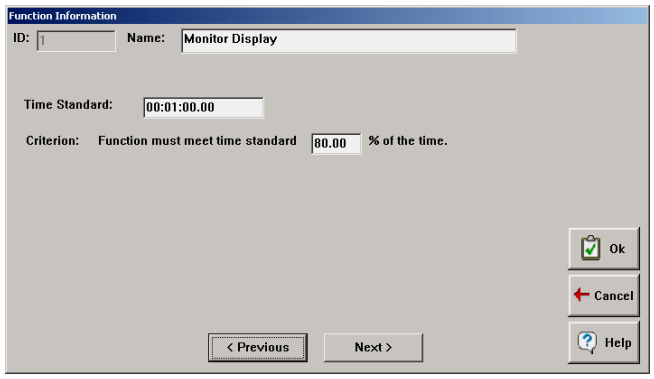
Select "Yes"

During the process of creating this network, do this every so often so you don't loose your work.

You can now begin renaming the functions and entering function data.

The function data is not necessary to execute your model but if you want to make comparisons at the function level this is where you would enter the data.

Double click on function "Function 1". Remember the time format is HH:MM:SS.dd



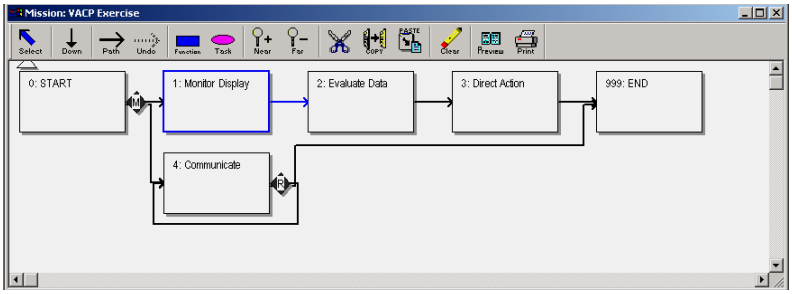
Name = **Monitor Display**
Time Standard = **00:01:00.00**
Criterion = **80.00**
Select "OK" or select "Next".

If you select "OK" you must double click on the next function you want to modify. If you select "Next" you will automatically go to the next function. For example you just finished modifying function 1. However, after you created your network you decided that function 3 should execute after function 1 and function 2 should execute after function 3 and that is how your network flows. When you select "Next" the functions will advance in chronological order, even if they do not execute in chronological order.

Here is the information you need to complete the remaining functions.

"Function 2"	"Function 3"	"Function 4"
Name = **Evaluate Data**	Name = **Direct Action**	Name = **Communicate**
Time Standard = **00:01:00.00**	Time Standard = **00:01:00.00**	Time Standard = **00:01:00.00**
Criterion = **80.00**	Criterion = **80.00**	Criterion = **80.00**

When finished entering the data for each function select "OK". This will take you back to the function network model.



Select "File/Full permanent save (network plus data)" to save your work. You will now begin to enter tasks for each function.

Task Network

For the purpose of this exercise you will enter all the data at one time. However, when you initially create your model, we suggest you begin by entering only the mean time; then execute your model to ensure that your paths are connected properly. If it executes without any errors, you can add more data. For instance, complete the ***Time&Acc*** tab for all the tasks and execute again. If that looks good then enter failure information, if appropriate, and execute your model again. It's easier to find a problem if you add data incrementally. If all is running smoothly then you can add more data. If after adding more data you begin having problems (i.e. your model is not giving you the results you expected) it will be easier to backtrack and find the problem.

Let's begin creating the network at the task level.

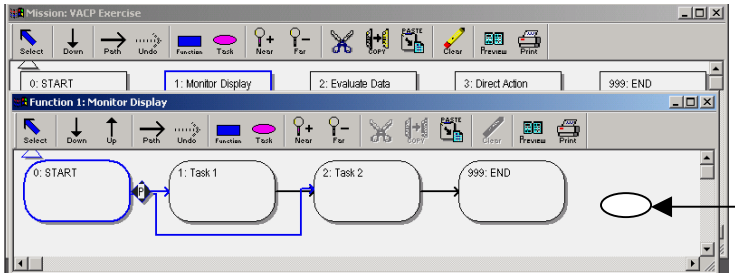
To create the task network - select the "Down" 

tool and click on the function **Monitor Display** to get to its task level. Create the task network.

Use the "Task" 

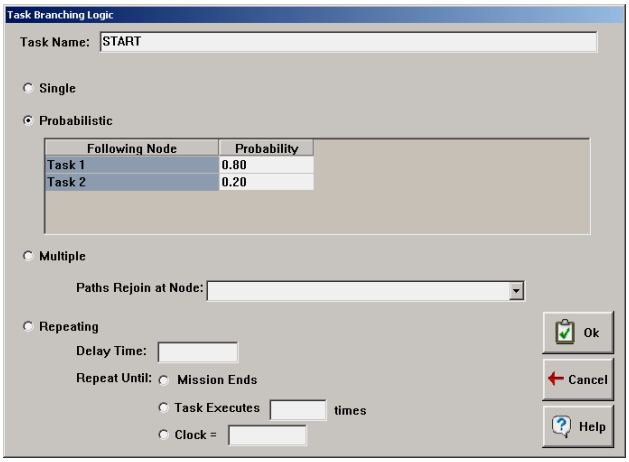
tool to add tasks. Then use the "Path" tool to draw your paths.

Connect START to Task 1 and to Task 2
Connect Task 1 to Task 2
Connect Task 2 to END



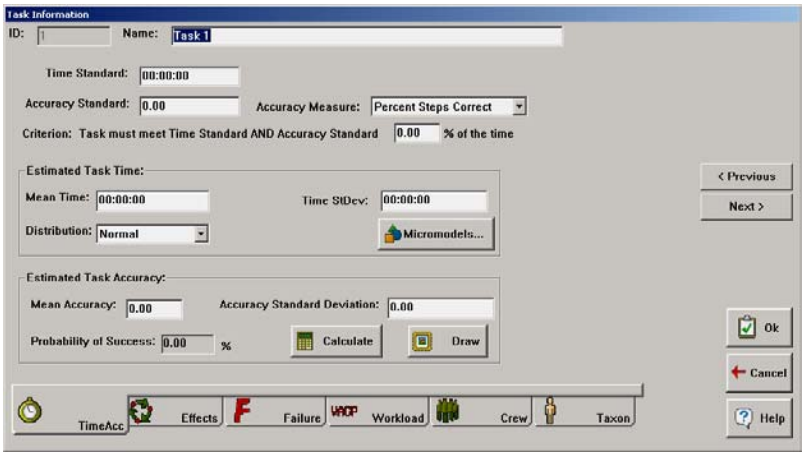
Define System Mission Exercise

Double click on the "Probabilistic" symbol  and enter the following information:



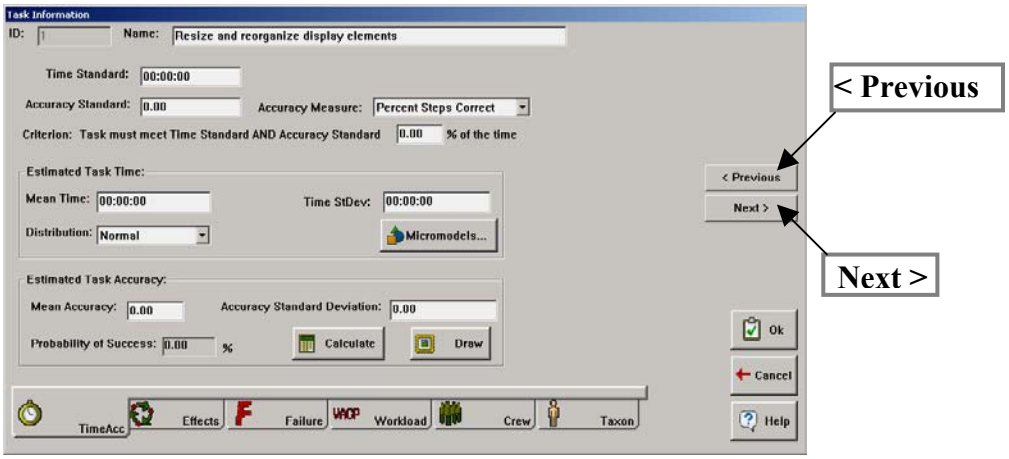
Probability - Task 1 = **0.80**
Task 2 = **0.20**

Double click on "Task 1"



Replace Task 1 with
Resize and reorganize display elements
in the "Name" field

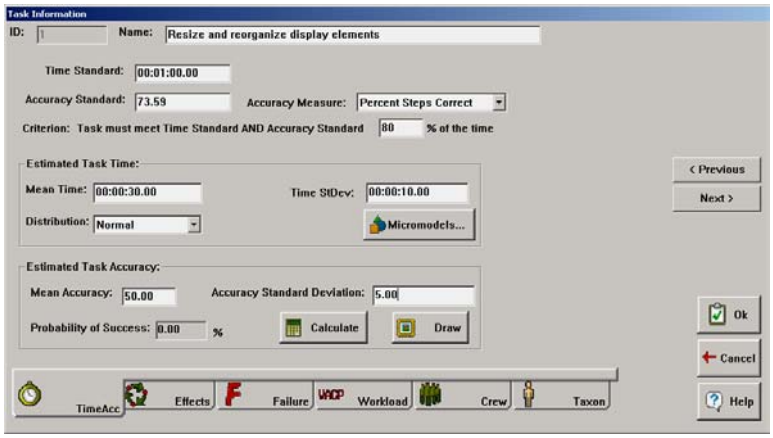
Now select the "Next >" button and this will take you to the task Task 2.



Name this task: **Read information**

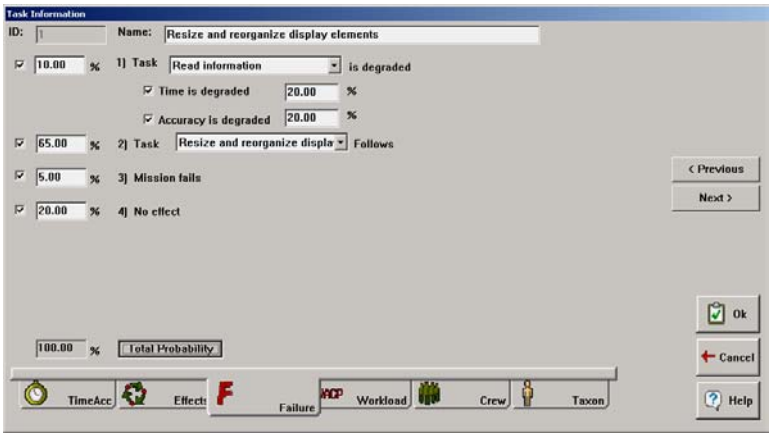
Define System Mission Exercise

Now select the "< Previous" button and this will take you back to **Resize and reorganize display elements.** On the ***Time&Acc*** tab enter the following information:



Time Standard = **00:01:00.00**
Accuracy Standard = **73.59**
Criterion = **80.00**
Mean Time = **00:00:30.00**
Time StDev = **00:00:10.00**
Mean Accuracy = **50.00**
Accuracy Standard Deviation = **5.00**

Select the ***Failure*** tab and enter the following information:

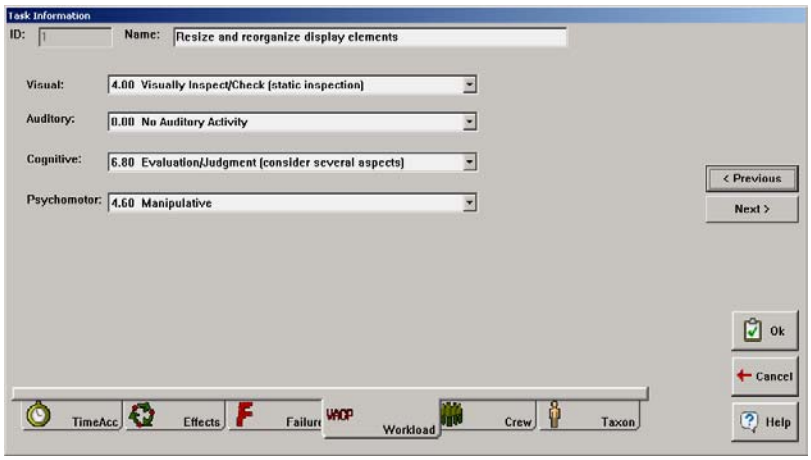


10.00 % 1)Task "Read Information" is degraded
Time is degraded **20.00** %
Accuracy is degraded **20.00** %
65.00 % 2) Task "Resize and reorganize display elements" Follows
5.00 % 3) Mission fails
20.00 % 4) No effect

"Total Probability" must equal 100.00%

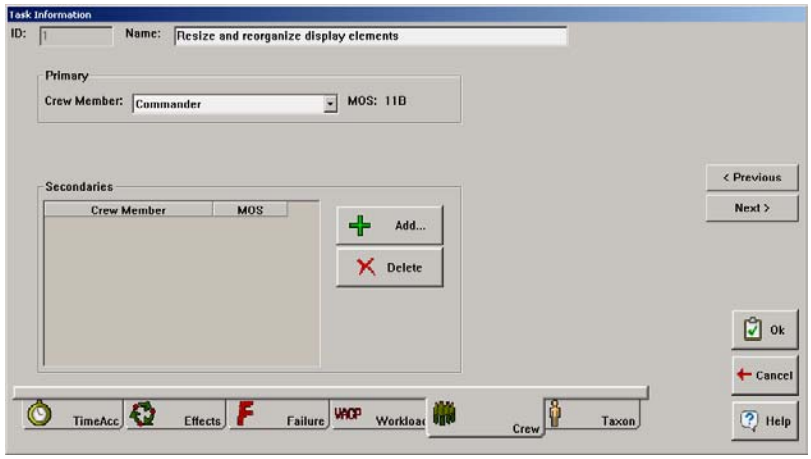
Define System Mission Exercise

Select the ***Workload*** tab and enter the following information:



Visual = **4.00**
Cognitive = **6.80**
Psychomotor = **4.60**

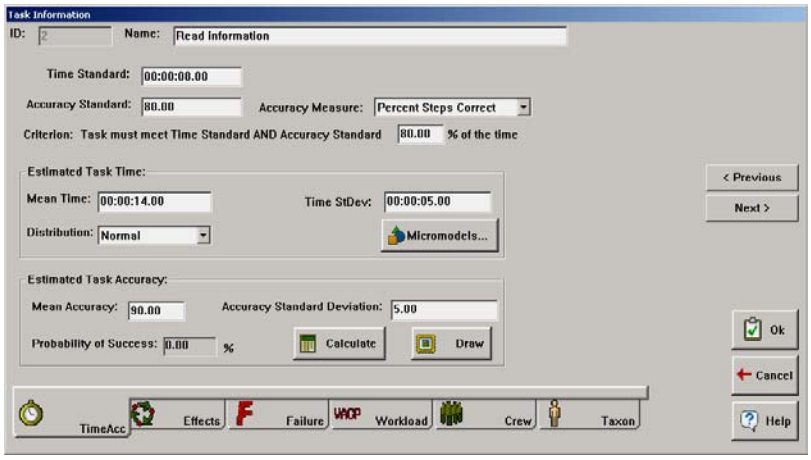
Select the ***Crew Assgn.*** Tab.



Primary Crew Member = **Commander**

When finished entering the "Crew Assgn". information, select "Next" and to go to the next task.
Task Information for – **Read information**

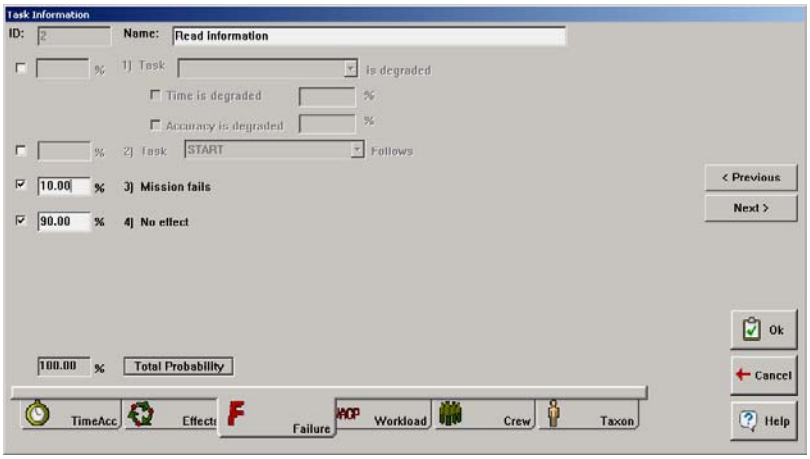
Enter ***Time&Acc*** tab information:



Time Standard = **00:00:08.00**
Accuracy Standard = **80.00**
Criterion = **80.00**
Mean Time = **00:00:14.00**
Time StDev = **00:00:05.00**
Mean Accuracy = **90.00**
Accuracy Standard Deviation = **5.00**

Define System Mission Exercise

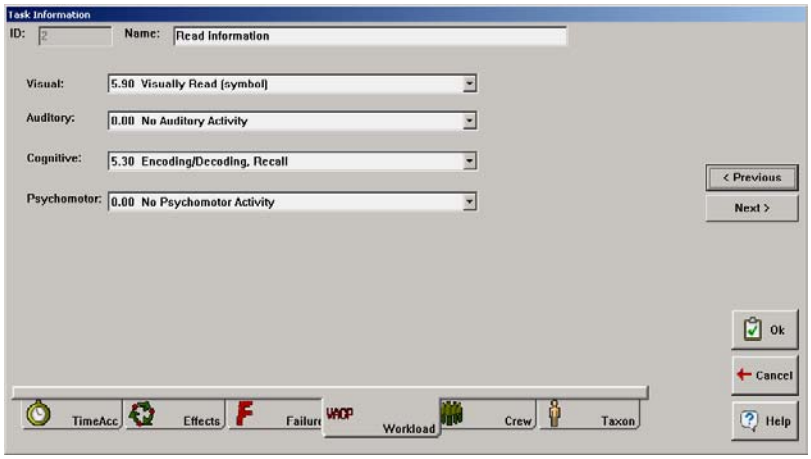
Enter ***Failure*** tab information.



10.00 % 3) Mission fails
90.00 % 4) No effect

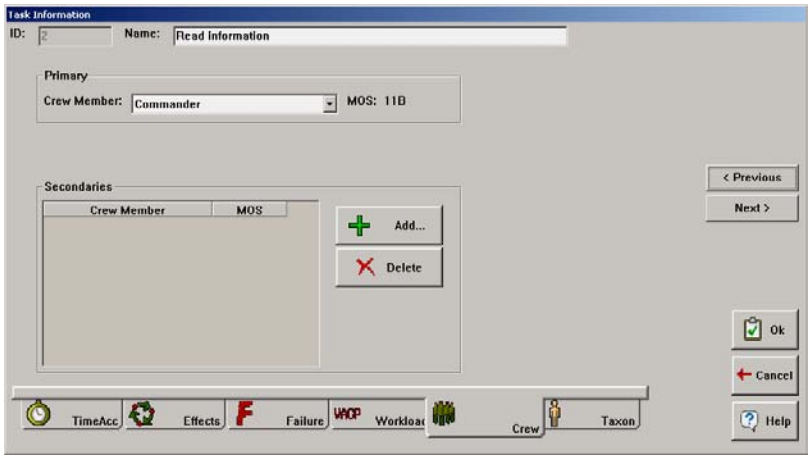
"Total Probability" must equal 100.00%

Enter ***Workload*** tab information.



Visual = **5.90**
Cognitive = **5.30**

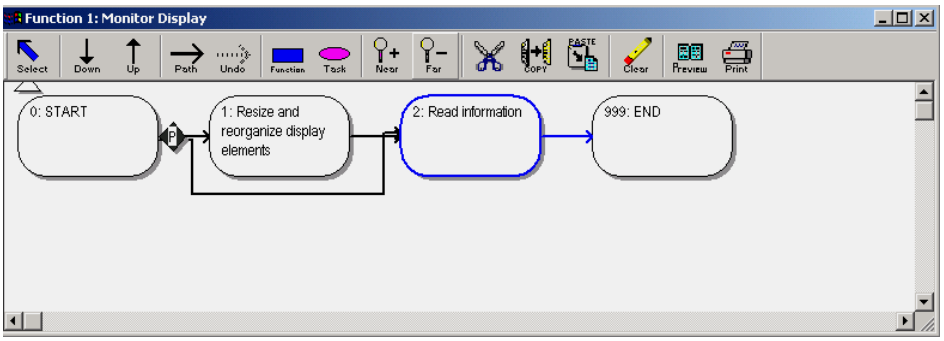
Enter ***Crew Assgn.*** tab information.



Primary Crew Member = **Commander**

You have now completed entering the task network and task information for the first function. Select "OK" to get back to task network.

Define System Mission Exercise



This may be a good time to save your analysis. Select "File/Full Permanent Save (network plus data)" from the main menu.

After saving your analysis, you can use the "Up" 

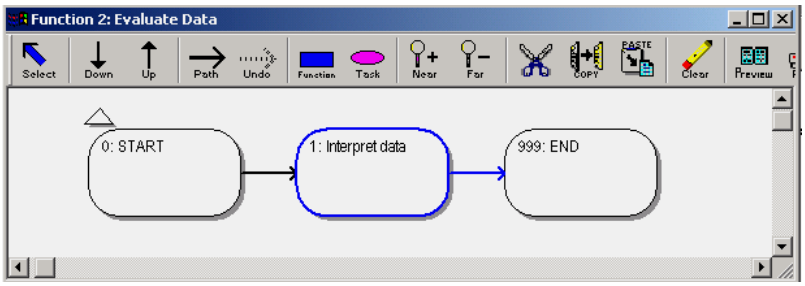
tool to get back to the function level.

Use the "Down" 

tool and begin creating the task network for function **Evaluate Data.**
Use the "Task" tool and create the network. This function has one task.
Connect "START" to Task 1
Connect Task 1 to "END"

Task Information for "Task 1".

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Name = **Interpret data**	Mission fails = **5.00**	Visual = **5.00**	Crewmember = **Commander**
Time Standard = **00:00:20.00**	No effect = **95.00**	Cognitive = **6.80**	
Accuracy Standard = **85.00**			
Criterion = **85.00**			
Mean Time = **00:00:15.00**			
Time StDev = **00:00:05.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			



When finished select "OK" and use the "Up" tool to get back to the function level.

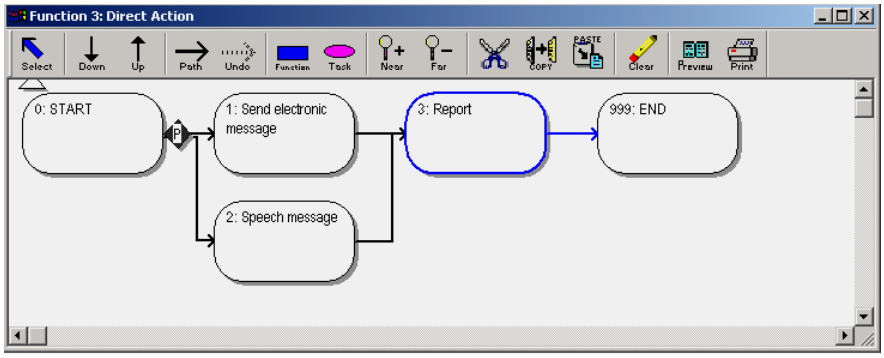
Use the "Down" tool and begin creating the task network for function **Direct Action**
Use the "Task" tool and create the network. This function has 3 tasks.
Connect "START" to Task 1 and Task 2
Connect Task 1 to Task 3
Connect Task 2 to Task 3
Connect Task 3 to "END"

Define System Mission Exercise

Double click on Task 1
Replace Task 1 with **Send electronic message** in the "Name" field

Now select the "Next >" button and this will take you to Task 2.
Name this task: **Speech Message**

Select the "Next >" button again and this will take you to Task 3.
Name this task: **Report**
Select the "Next >" one more time and this will take you back to the first task, **Send electronic message**.



Probabilistic
Send electronic message = **50.00**
Speech message = **50.00**

Task Information for "Send electronic message".

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:45.00**	Task "Send electronic message" follows = **20.00**	Visual = **5.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **80.00**	Auditory = **1.00**	
Criterion = **85.00**		Cognitive = **5.30**	
Mean Time = **00:00:24.00**		Psychomotor = **7.00**	
Time StDev = **00:00:05.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task – "Speech Message"

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:15.00**	Task "Speech Message" follows = **80.00**	Auditory = **4.30**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **20.00**	Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = **1.00**	
Mean Time = **00:00:10.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **10.00**			

Define System Mission Exercise

Task Information for task – "Report"

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:30.00**	Task "Report" follows = **10.00**	Auditory = **4.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **90.00**	Cognitive = **6.80**	
Criterion = **85.00**		Psychomotor = **1.00**	
Mean Time = **00:00:17.00**			
Time StDev = **00:00:50.00**			
Mean Accuracy = **95.00**			
Accuracy Standard Deviation = **5.00**			

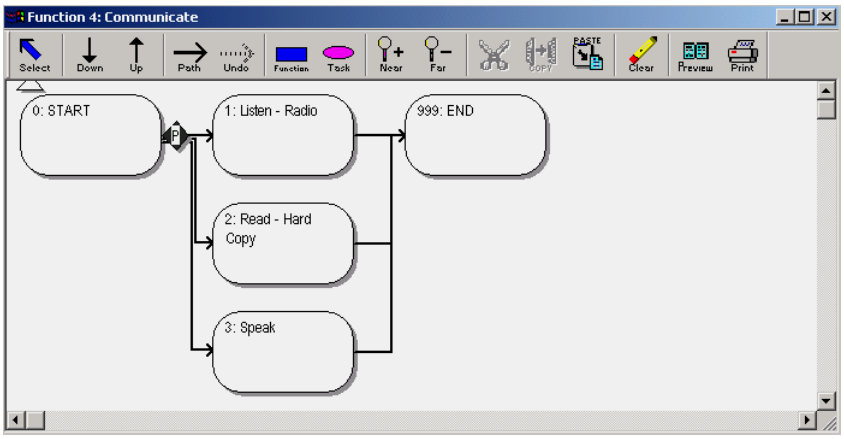
When finished use the "Up" tool to go back to the function level.
Use the "Down" tool and begin creating the task network for function **Communicate**
Use the "Task" tool and create the network. This function has 3 tasks.

Connect "START" to Task 1, Task 2 and Task 3
Connect Task 1 to "END"
Connect Task 2 to "END"
Connect Task 3 to "END"

Double click on Task 1
Replace Task 1 with **Listen - Radio** in the "Name" field

Now select the "Next >" button and this will take you to Task 2.
Name this task: **Read – Hard Copy**

Select the "Next >" button again and this will take you to Task 3.
Name this task: **Speak**
Select the "Next >" one more time and this will take you back to the first task, **Listen - Radio**.



Probabilistic
Listen – Radio = **0.33**
Read – Hard Copy = **0.33**
Speak = **0.34**

Task Information for task "Listen - Radio"

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:10.00**	Task "Listen - Radio" follows = **100.00**	Auditory = **4.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**		Cognitive = **5.30**	
Criterion = **85.00**			
Mean Time = **00:00:06.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task "Read – Hard Copy"

Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:10.00**	Task "Read – Hard Copy" follows = **90.00**	Visual = **5.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **10.00**	Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = **4.60**	
Mean Time = **00:00:07.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task "Speak"

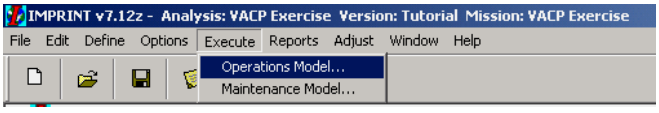
Time&Acc tab	***Failure*** tab	***Workload*** tab	***Crew Assgn.*** tab
Time Standard = **00:00:20.00**	Task "Speak" follows = **100.00**	Auditory = **4.30**	Crewmember = **Commander**
Accuracy Standard = **80.00**		Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = **1.00**	
Mean Time = **00:00:13.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

You may have noticed you did not enter any information under the "Taxon" tab. This will be discussed in the "Stressors & Performance Shaping Function Exercise" section of this tutorial.

Save your analysis and close the Network windows. When asked if you want to save your diagram with their task and function information – select "Yes".

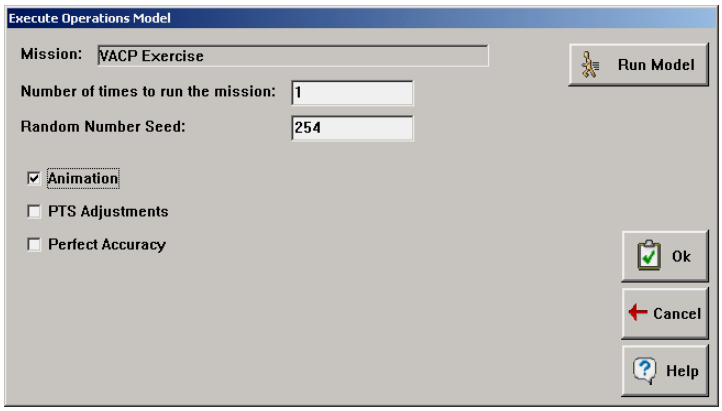
Execute mission

To execute your mission select "Execute/Operations Model…"



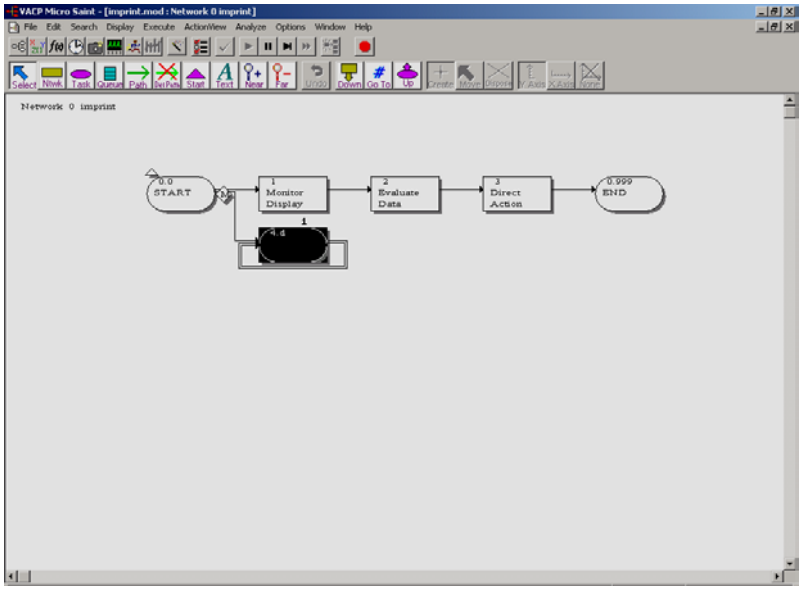
On the Execute Operations Model screen, enter the number of times you want to run the mission and a random number seed. For this exercise we will select "Animation". You may select to run the mission model with or without animation. If you check "Animation," a schematic of your network will be

displayed when the mission model is running. Current functions or tasks being executed will be indicated with black nodes.

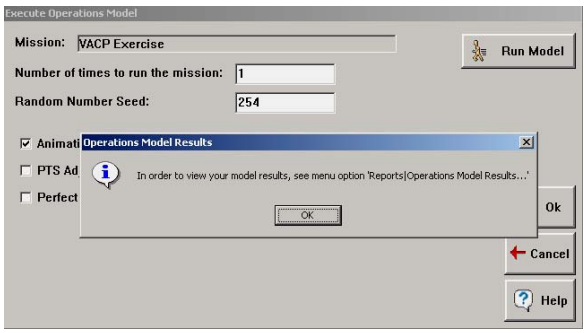


Number of time to run the mission: **1**
Random Number Seed: **254**
Select "Run Model"

Since we selected "Animation", you will see a screen similar to the following screen. However, since this model is a short one, the screen will flash by. You may only see a processing screen and then a report message.



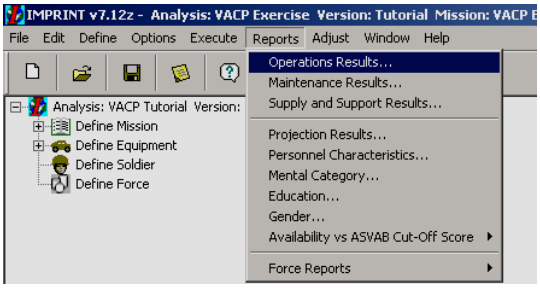
Once the model is finished executing, you will see the Execute Operations Model screen and a dialog box informing you that you may view your reports by using the menu option "Reports/Operations Model Results…"



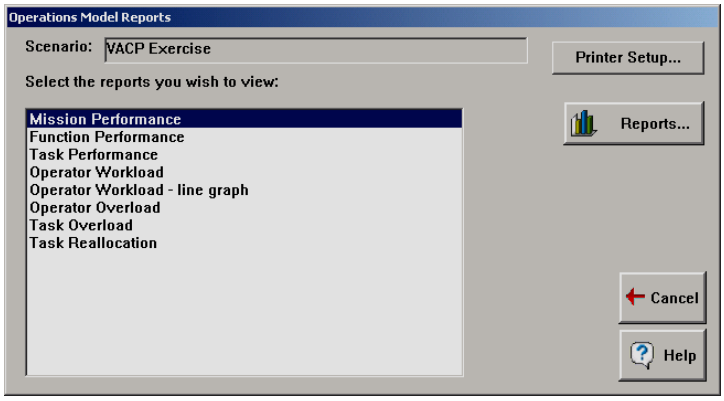
Select "OK" to close the "Operations Model Results" dialog box and then select "OK" to close the Execute Operations Model screen.

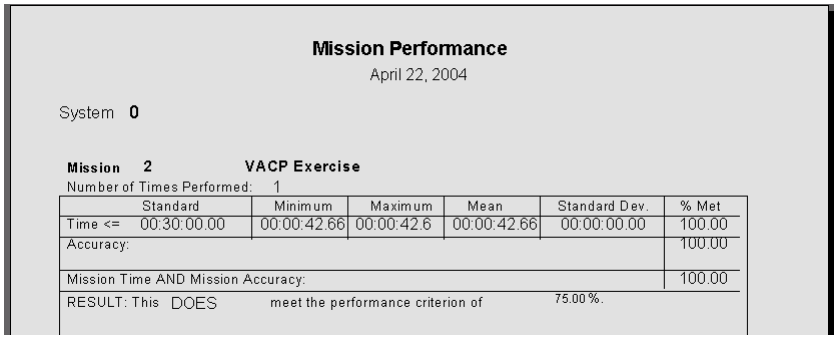
Accessing Reports.

Select "Reports/Operations Model Results…" from the menu.



Select "Mission Performance" and then select "Reports"





Mission Performance

April 22, 2004

System 0

Mission 2 VACP Exercise

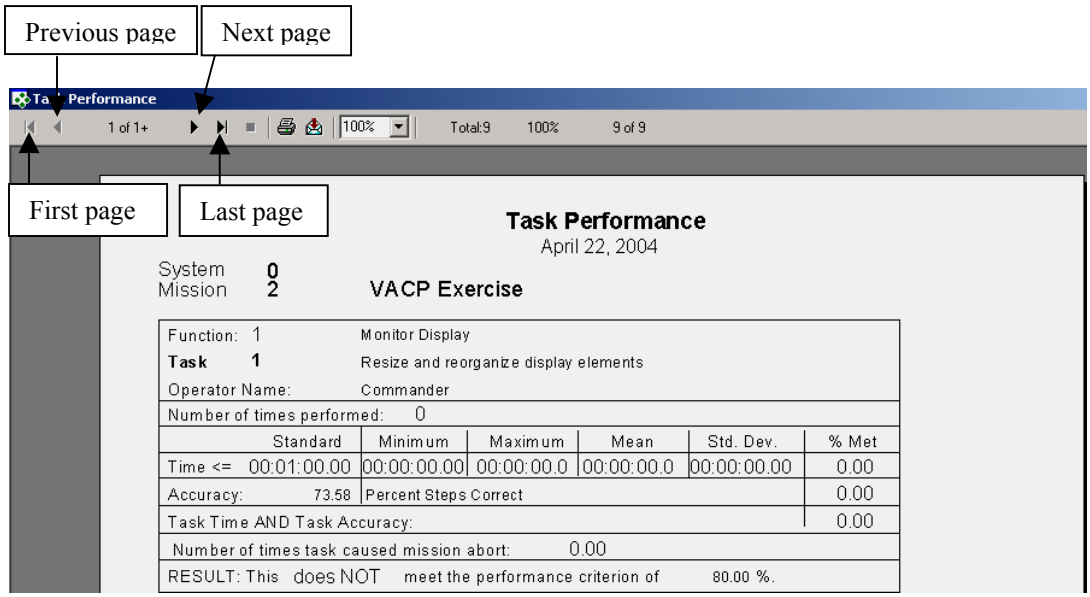
Number of Times Performed: 1

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:42.66	00:00:42.6	00:00:42.66	00:00:00.00	100.00
Accuracy:						100.00
Mission Time AND Mission Accuracy:						100.00

RESULT: This DOES meet the performance criterion of 75.00 %.

******Note***: When you are looking at a report, if there are several pages, you can navigate through the report by using the arrows identified below.

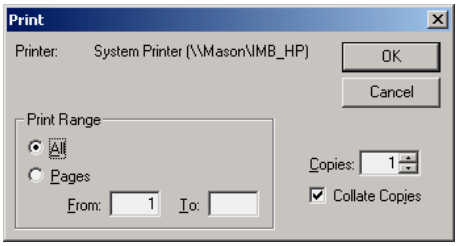
Define System Mission Exercise



If you want a copy of the report you can print it by selecting the "Printer"  icon or save the report by selecting the icon that looks like an envelope  .

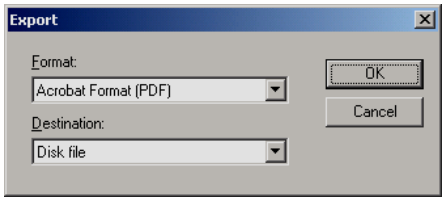
Printing Reports

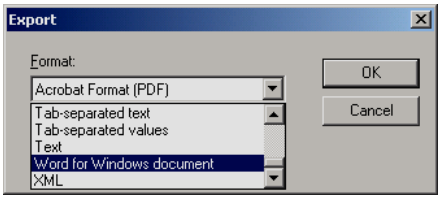
If you decide to print the report, you will get the following dialog box. You can choose to print all the pages or select how many pages you want to print. Select "OK" and your report will print to your default printer.



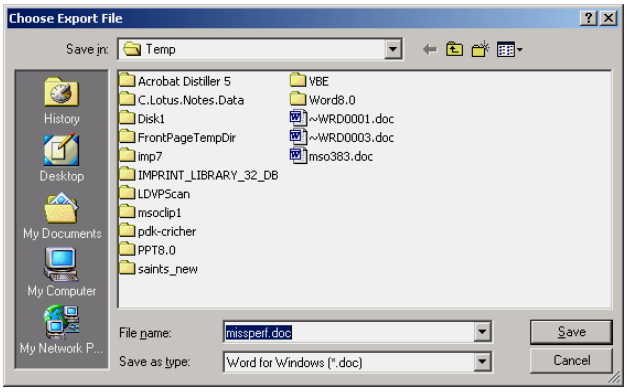
Saving Reports

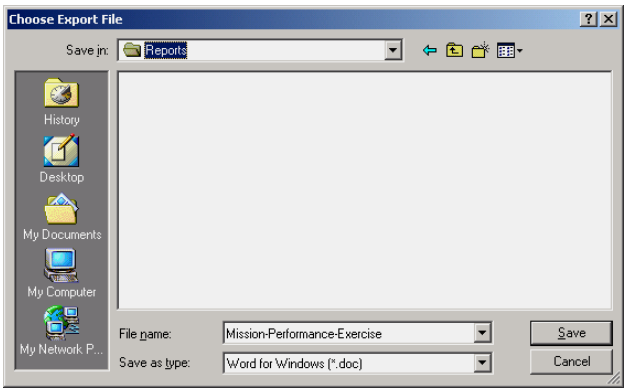
If you want to save the report(s), select the envelope icon. When you see the following Export screen, select the file format. In this example, the format selected is "Word for Windows document". The destination defaults to "Disk file". Don't change it. Then select OK.





You will then see a screen similar to the following screen. In this case the default folder is the "Temp" folder. For this exercise I decided to select another folder. I selected the "Reports" folder I created under "imprint7". You can select another drive and/or another folder. For the "Mission Performance" report, the default filename is "missperf.doc". If you intend to save several iterations of this report you should rename it, otherwise it will be overwritten the next time you execute your model and then save the report. Filenames for IMPRINT follow the Windows format. You can give it any name you want. In this example the filename is "Mission-Performance-Exercise". The extension will be ".doc"



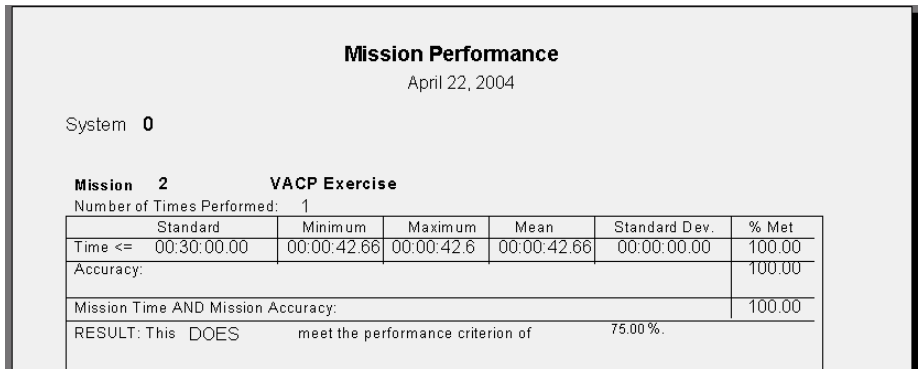


After you have entered the filename and selected the folder, select "OK". The file will be saved to your computer. You can then modify it, if needed, to include in a report.

Look at the different reports.

Operations Model Results Reports

The Mission Performance report will give you the Mission Time Standard and the Achieved Mission Time. The Achieved Mission Time is the performance time that was simulated as a result of the individual task's performance times. If the Achieved Mission Time is less than or equal to the Mission Time Standard, you will also see a message that says the mission passed the requirement. If the Mission Time Standard is less than the Achieved Mission Time, then the mission failed its performance time standard. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time in which you met the standard to be 0%.



Mission Performance

April 22, 2004

System **0**

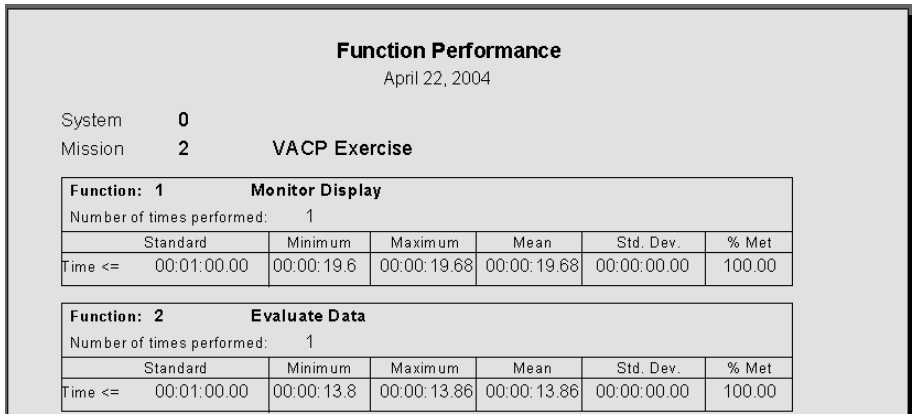
Mission 2 VACP Exercise

Number of Times Performed: 1

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:42.66	00:00:42.6	00:00:42.66	00:00:00.00	100.00
Accuracy:						100.00
Mission Time AND Mission Accuracy:						100.00

RESULT: This DOES meet the performance criterion of 75.00 %.

The Function Performance report includes a summary of each function that was performed, the number of times it was performed, and the minimum, maximum, mean and standard deviation of the performance times. This report also indicates the function performance time standard, and compares the results of the simulation to that standard. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time you met the standard to be 0%.



Function Performance

April 22, 2004

System **0**

Mission **2** **VACP Exercise**

Function: 1 Monitor Display

Number of times performed: 1

	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:01:00.00	00:00:19.6	00:00:19.68	00:00:19.68	00:00:00.00	100.00

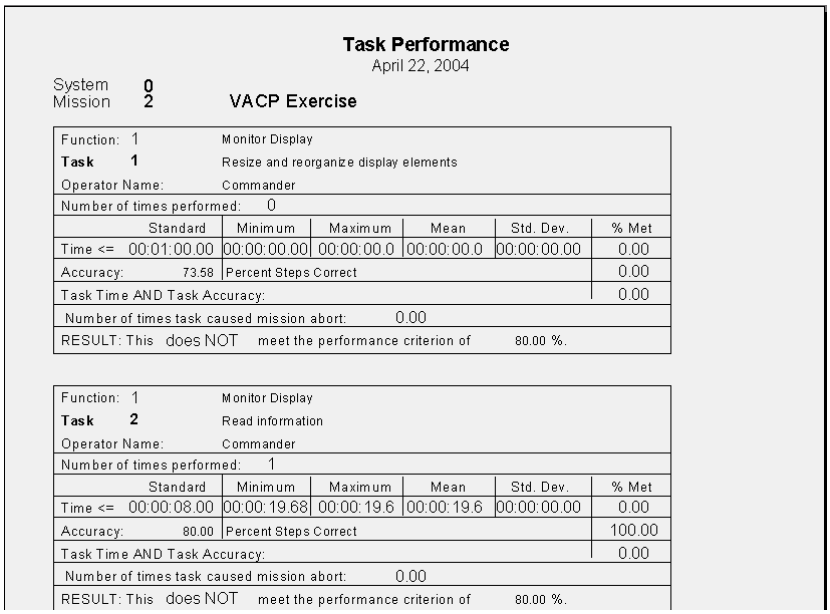
Function: 2 Evaluate Data

Number of times performed: 1

	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:01:00.00	00:00:13.8	00:00:13.86	00:00:13.86	00:00:00.00	100.00

Define System Mission Exercise

The Task Performance report is a detailed report that provides output for each task in your mission model. The simulated (or predicted) performance time and accuracy is included on the report. The predicted values are compared to the task time standard and the percentage of occurrences in which the predicted time met the standard is reported. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time you met the standard to be 0%. This report also includes a summary of the performance accuracy that was predicted for each task, and the number of times that task failure led to mission failure.



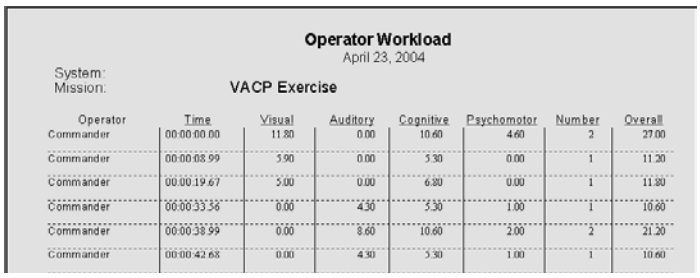
Task Performance
April 22, 2004

System 0
Mission 2 VACP Exercise

Function: 1	Monitor Display					
Task 1	Resize and reorganize display elements					
Operator Name:	Commander					
Number of times performed:	0					
	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:01:00.00	00:00:00.00	00:00:00.0	00:00:00.0	00:00:00.00	0.00
Accuracy:	73.58	Percent Steps Correct				0.00
Task Time AND Task Accuracy:						0.00
Number of times task caused mission abort:	0.00					
RESULT: This does NOT meet the performance criterion of	80.00 %.					

Function: 1	Monitor Display					
Task 2	Read information					
Operator Name:	Commander					
Number of times performed:	1					
	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:00:08.00	00:00:19.68	00:00:19.6	00:00:19.6	00:00:00.00	0.00
Accuracy:	80.00	Percent Steps Correct				100.00
Task Time AND Task Accuracy:						0.00
Number of times task caused mission abort:	0.00					
RESULT: This does NOT meet the performance criterion of	80.00 %.					

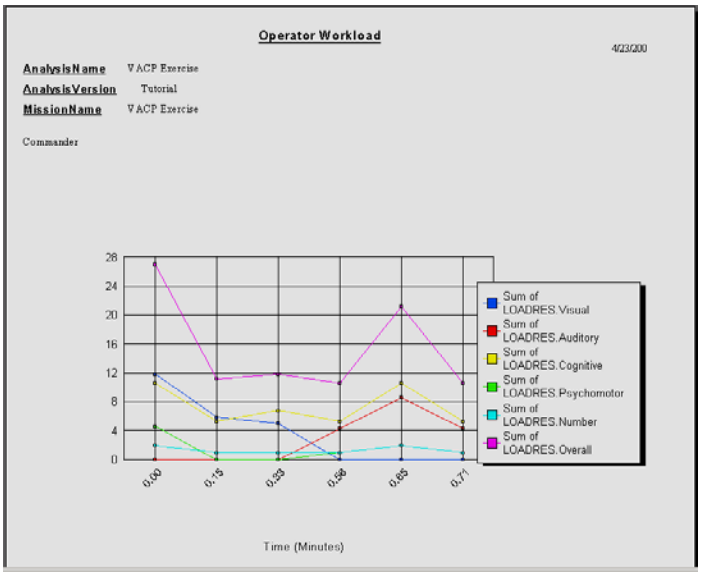
The Operator Workload report includes a listing of each operator's workload throughout the mission timeline. This report can easily be exported to Excel for graphing. Alternatively, you can use the Operator Workload Report - Line Graph option to get a simple graphical report.



Operator Workload
April 23, 2004

System:
Mission: VACP Exercise

Operator	Time	Visual	Auditory	Cognitive	Psychomotor	Number	Overall
Commander	00:00:00.00	11.80	0.00	10.60	4.60	2	27.00
Commander	00:00:08.99	3.90	0.00	5.30	0.00	1	11.20
Commander	00:00:19.67	3.00	0.00	6.80	0.00	1	11.80
Commander	00:00:33.36	0.00	4.30	5.30	1.00	1	10.60
Commander	00:00:38.99	0.00	8.60	10.60	2.00	2	21.20
Commander	00:00:42.68	0.00	4.30	5.30	1.00	1	10.60

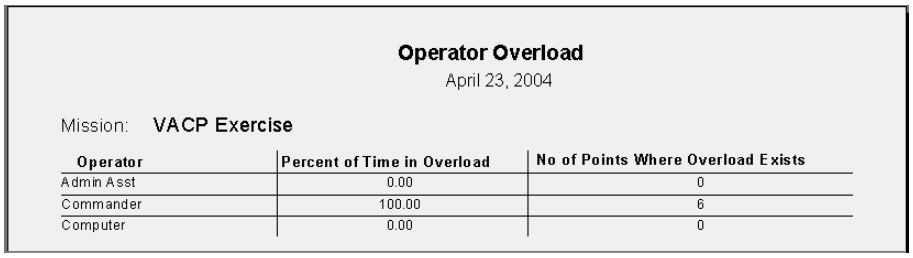


Define System Mission Exercise

The final three reports are associated with reporting operator overload, if any occurred during your mission.

The following reports will be discussed in a future exercise in this tutorial. If you look at them now either you will have "0" in some or all fields or in the case of the Task Reallocation report you will only see the header.

The Operator Overload report tells you the percentage of time each operator spent in an overload condition.



Operator Overload

April 23, 2004

Mission: VACP Exercise

Operator	Percent of Time in Overload	No of Points Where Overload Exists
Admin Asst	0.00	0
Commander	100.00	6
Computer	0.00	0

The Task Overload report provides a summary of the number of times each task began, and the number of times the task began in an overload condition.

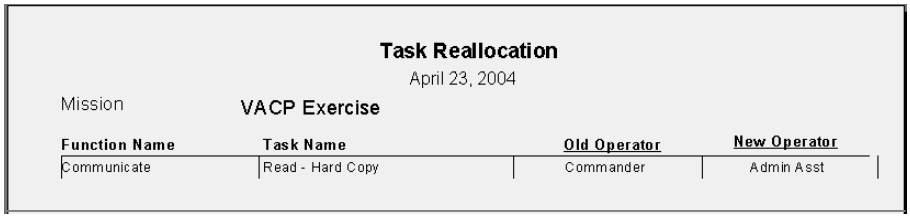
Task Overload

April 23, 2004

Mission VACP Exercise

Function Name	Task Name	Times Started	% of Times in Overload
Communicate	Listen - Radio	0	0.00
Communicate	Read - Hard Copy	1	100.00
Communicate	Speak	1	100.00
Direct Action	Report	1	0.00
Direct Action	Send electronic message	0	0.00
Direct Action	Speech message	1	100.00
Evaluate Data	Interpret data	1	100.00
Monitor Display	Read information	1	100.00
Monitor Display	Resize and reorganize display elements	0	0.00

The Task Reallocation report summarizes the result of any task reallocation.



Task Reallocation

April 23, 2004

Mission VACP Exercise

Function Name	Task Name	Old Operator	New Operator
Communicate	Read - Hard Copy	Commander	Admin Asst

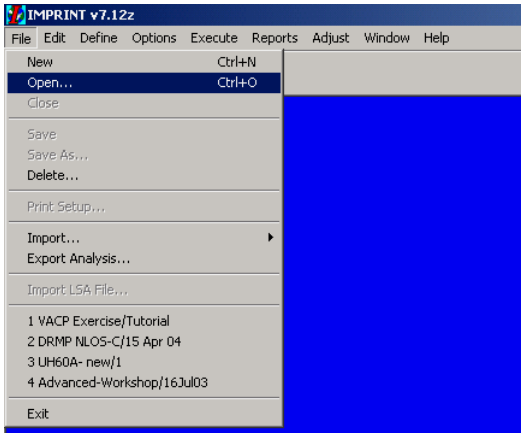
Stressors & Performance Shaping Function Exercise

The Stressors & Performance Shaping Functions are done using the **PTS** Option (**P**ersonnel Characteristics/**T**raining Frequency/**S**tressors)

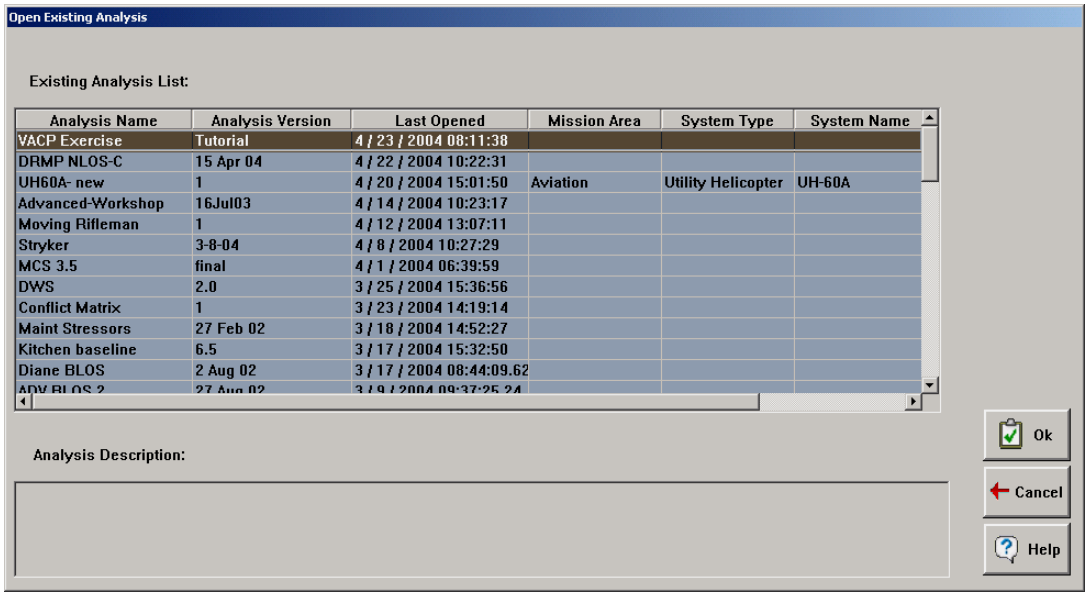
For more information on **P**ersonnel Characteristics/ **T**raining Frequency/**S**tressors see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

Use the analysis you created in the "Define System Mission Exercise" section.

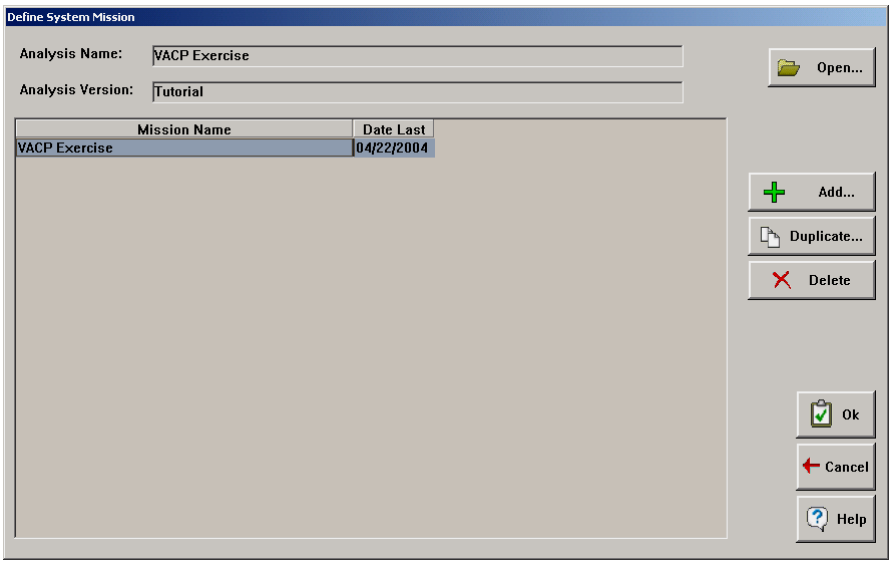
Start IMPRINT, select File/Open…



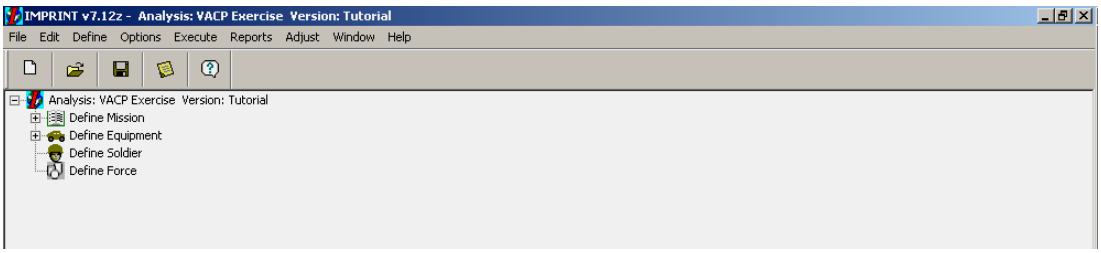
From the Open Existing Analysis screen, highlight "VACP-Exercise" (as shown below) and select OK



Open your mission by selecting "Define/System Mission…..", then select "Open" on the Define System Mission screen.



Select OK until you are back to the Main screen.

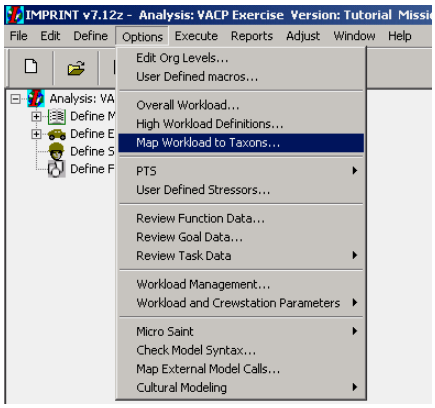


Go to "Options" and select "Map Workload to Taxons."

******Note:*** If you do not want to enter taxons, but you have already entered workload assignments, you can use the "Map Workloads to Taxons" capability. Without taxons you cannot apply Personnel Characteristics, Training Frequency or Stressor adjustments. (For more information on Taxons and how IMPRINT assigns them look in the "IMPRINT Users Guide" under "Taxons" and "Map Workload to Taxons" or for a quick look at how workload is mapped to taxons look at "Mapping Workload to Taxons" (page 111) at the end of this tutorial.)

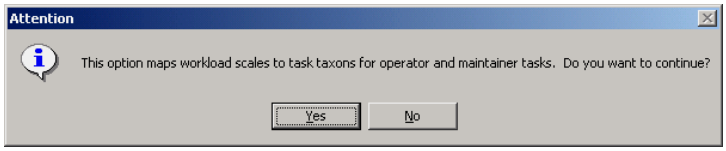
Stressors & Performance Shaping Function Exercise

Taxons provide a method for you to describe the composition of your task and are used in IMPRINT to adjust estimated task times and accuracies when you apply Personnel Characteristics, Training Frequency or Stressor adjustments.



******Note***: This option will be useless if you have not already assigned workload. If you decide not to assign workload then you must manually enter the taxons.

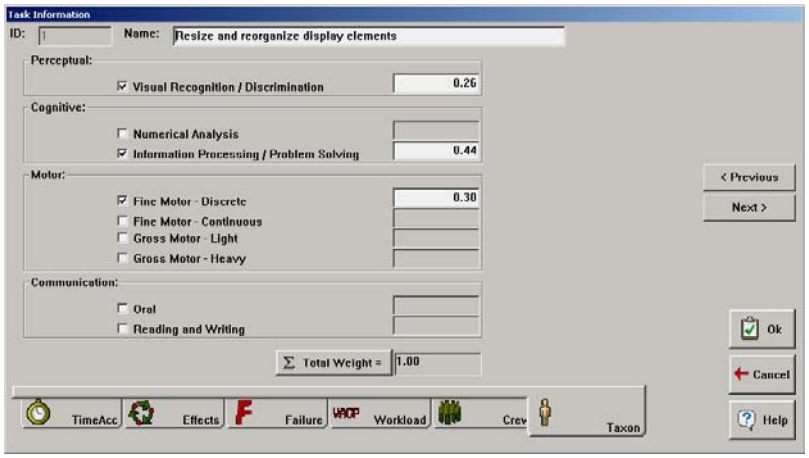
You will get a dialog box informing you what actions this option performs and asking if you want to continue. Select "Yes.



Go back to the "Network Diagram". (You will find the network diagram by selecting Define/System Mission.) On the Define System Mission screen select "Open" to open your mission. On the Mission Information screen select "Functions + Tasks".

On the Function and Task List screen select "Network Diagram". Select any function and go to the task level using the "Down" tool.

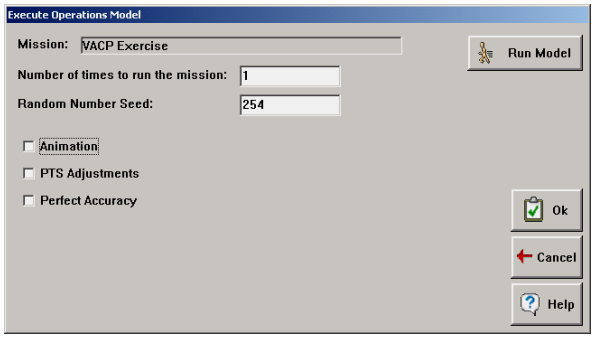
Double click on any task and select the "Taxon" tab. You will see that IMPRINT has assigned the taxons associated with the workload you have assigned:



Look at several tasks. If you have assigned some taxons and used the "Map Workload to Taxons" option, IMPRINT will not replace the taxons you have assigned. It will only assign taxons to tasks where there is workload and no previously assigned taxons.

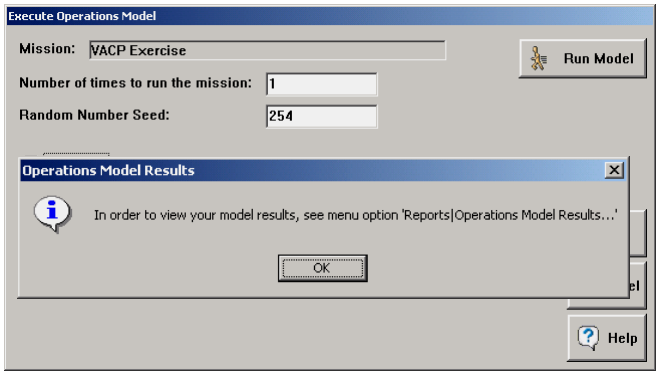
Close and save the network diagram. Be sure to back out completely until you are back to the Main screen.

Select Execute/Operations Model... Enter the number of times you want to run the mission and a random number seed. Select "Run Model" to execute (This will be your baseline)



Number of times to run the mission: **1**
Random Number Seed: **254**

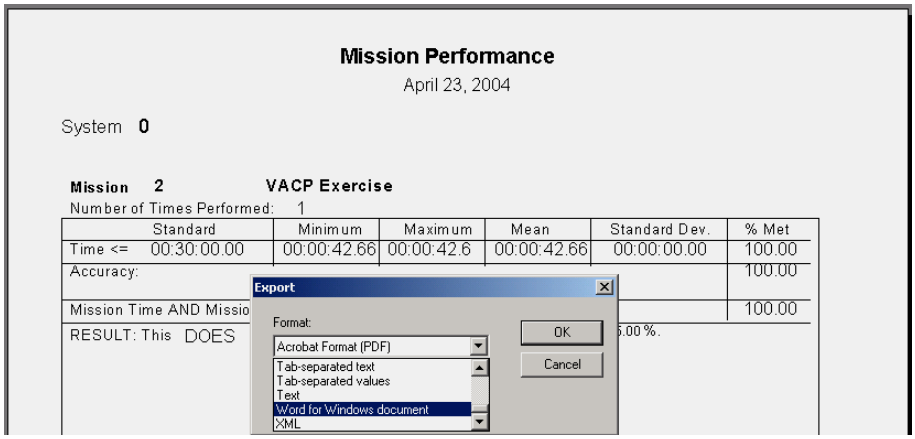
When finished executing you will get a dialog box informing you where to find reports. Select "OK".



Look at results (Mission Performance, Function Performance, and Task Performance reports). If you want to keep this run to compare the results with another run, you will need to save the reports.

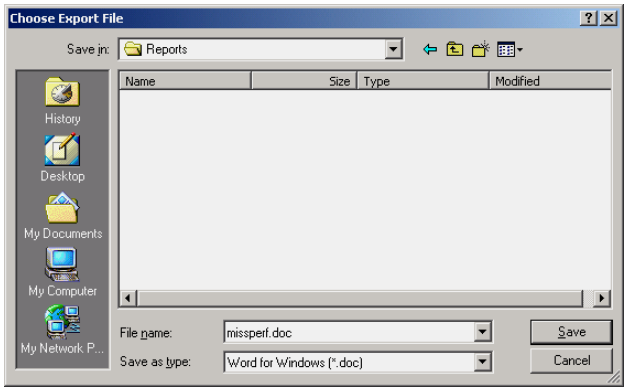
> ******Note:*** For this tutorial we are looking at the results on the operator side (Define System Mission). However, stressors and performance shaping functions can be applied to maintainer MOSs and in that case you would execute your maintenance model before applying, check your Maintenance Model Results reports and check them again after applying.

To save a report, select the "Envelope"  tool and then select the format in which you want to save the report. Select OK. In this case the format we are selecting is "Word for Windows document".



You will then see another dialog box. Select the drive and then the folder where the report will be saved. In this example a "Reports" folder had been created under the "imprint7" folder to store reports. The default report name is shown. For the "Mission Performance" report the default name is "missperf.doc".

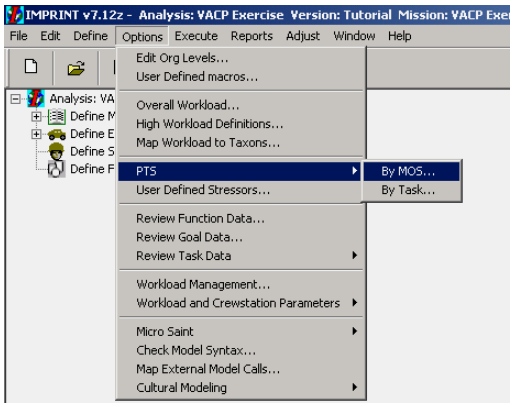
> ******Note:*** If you want to save different versions of a particular report remember to change the name each time, otherwise the previous report will be overwritten with the information from the latest run.



Personnel Characteristics

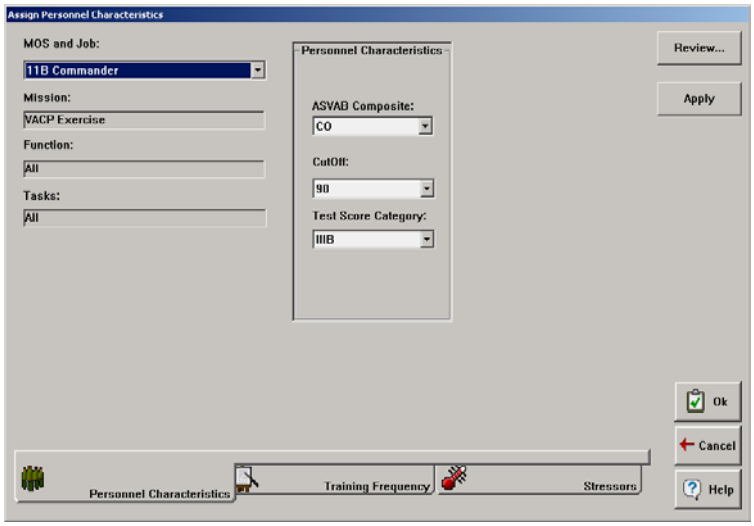
You will now apply PTS (**P**ersonnel Characteristics **T**raining Frequency **S**tressors), execute and then compare results with your baseline.

Select "Options/PTS/by MOS". For information on PTS adjustments see the IMPRINT Analysis Guide, Chapters 8-10.

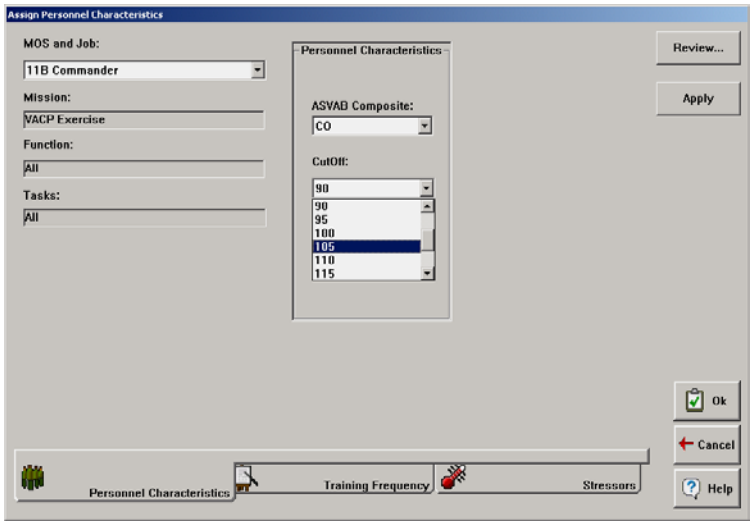


Note the original "Cutoff" (90).

*** The current "Cutoff" is the minimum requirement for this MOS (see DA PAM 611-21)

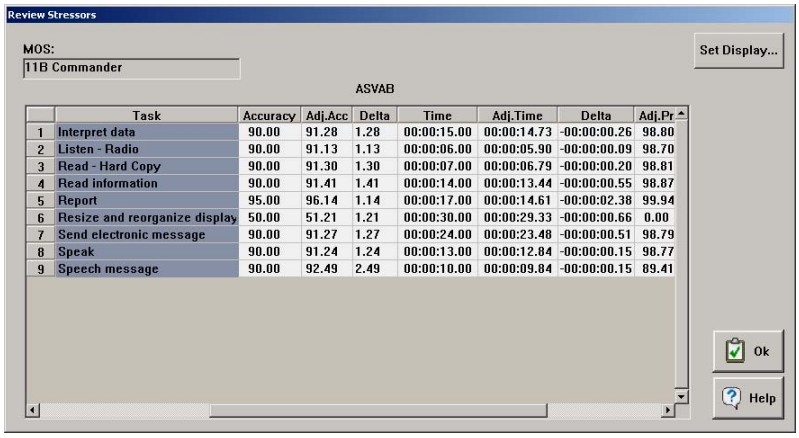


Increase Personnel Characteristics –



Change "CutOff" to **105**.

Select "Apply", then "Review". When finished reviewing the data select OK to close Review Stressors screen, select OK again to close Assign Personnel Characteristics screen

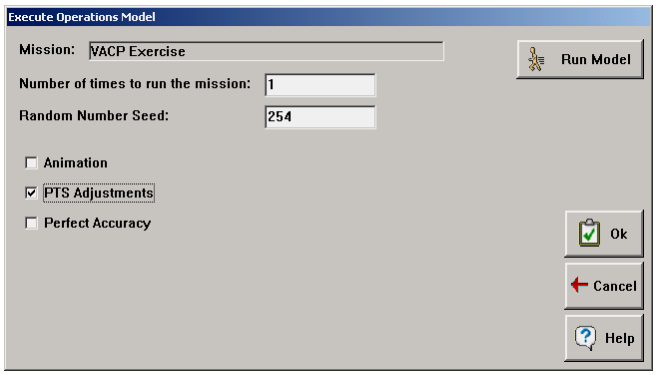


	Task	Accuracy	Adj.Acc	Delta	Time	Adj.Time	Delta	Adj.Pr
1	Interpret data	90.00	91.28	1.28	00:00:15.00	00:00:14.73	-00:00:00.26	98.80
2	Listen - Radio	90.00	91.13	1.13	00:00:06.00	00:00:05.90	-00:00:00.09	98.70
3	Read - Hard Copy	90.00	91.30	1.30	00:00:07.00	00:00:06.79	-00:00:00.20	98.81
4	Read information	90.00	91.41	1.41	00:00:14.00	00:00:13.44	-00:00:00.55	98.87
5	Report	95.00	96.14	1.14	00:00:17.00	00:00:14.61	-00:00:02.38	99.94
6	Resize and reorganize display	50.00	51.21	1.21	00:00:30.00	00:00:29.33	-00:00:00.66	0.00
7	Send electronic message	90.00	91.27	1.27	00:00:24.00	00:00:23.48	-00:00:00.51	98.79
8	Speak	90.00	91.24	1.24	00:00:13.00	00:00:12.84	-00:00:00.15	98.77
9	Speech message	90.00	92.49	2.49	00:00:10.00	00:00:09.84	-00:00:00.15	89.41

Note the "Deltas". The "CutOff" was increased. This caused the Accuracy to increase and the Time to decrease. In this case it appears that all tasks were affected. However, there may be times when you will not see any affect.

To see what types of tasks are impacted see "PTS Impact on Tasks" on page 109.

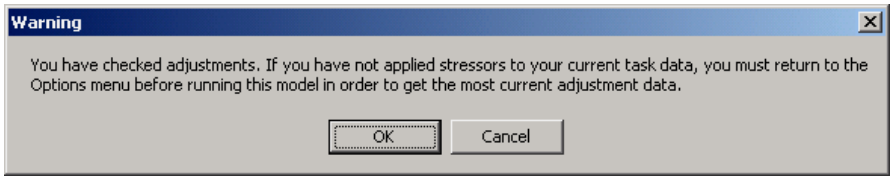
Select Execute/Operations Model... and select "PTS Adjustments" - use same number of runs and random number. Then select "Run Model."



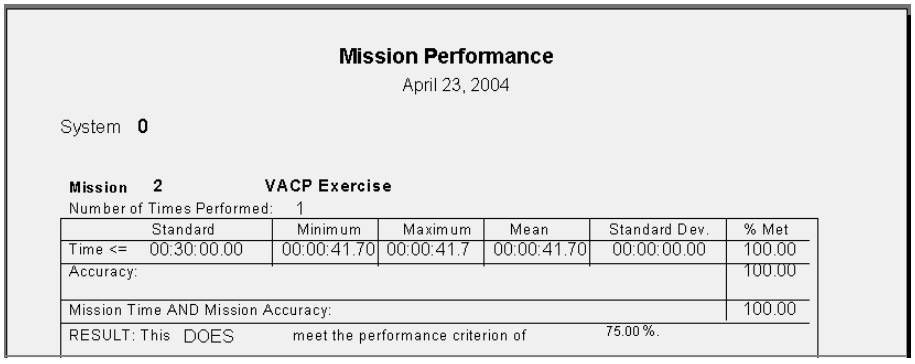
When "PTS Adjustments" is selected IMPRINT will use the task times and accuracies that were adjusted as a result of the applied Personnel Characteristics, Training Frequency and/or Stressors.

When you select "PTS Adjustments" you will see the following dialog box to remind you that if you have NOT applied stressors you should return to the "Options" menu and do so. In this case, "stressors" refers to the "Personnel Characteristics" you just applied.

Select "OK"



When finished select "OK" when you see the message referring to reports and go look at results. Compare to baseline. Do you see any changes? You should see that in this case the mission took less time.



Mission Performance

April 23, 2004

System **0**

Mission 2 VACP Exercise

Number of Times Performed: 1

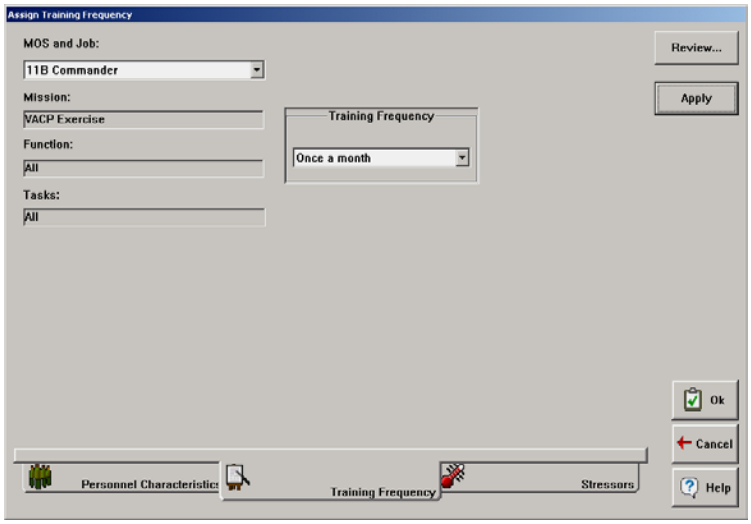
	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:41.70	00:00:41.7	00:00:41.70	00:00:00.00	100.00
Accuracy:						100.00
Mission Time AND Mission Accuracy:						100.00

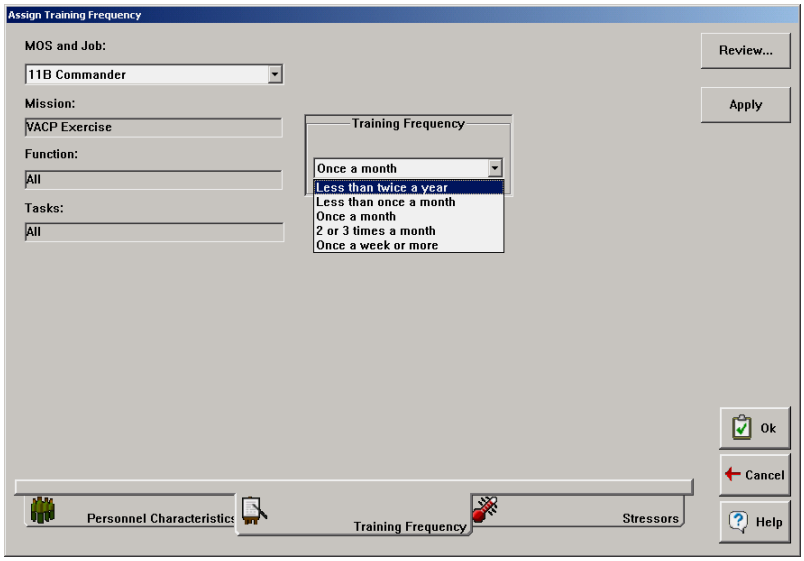
RESULT: This DOES meet the performance criterion of 75.00 %.

Training Frequency

Select "Options/PTS/by MOS". Set "Personnel Characteristics " back to original by reapplying the original cutoff. Select the original "CutOff", in this case the original "CutOff" was 90, and then select "Apply". Select "Apply" a second time. (Be sure to select apply twice to ensure data are set back to original.)

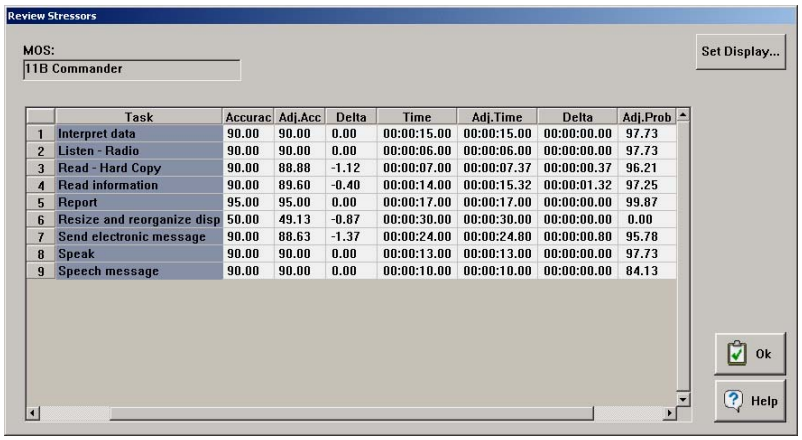
Select "Training Frequency" tab. Notice that the default is "Once a month".





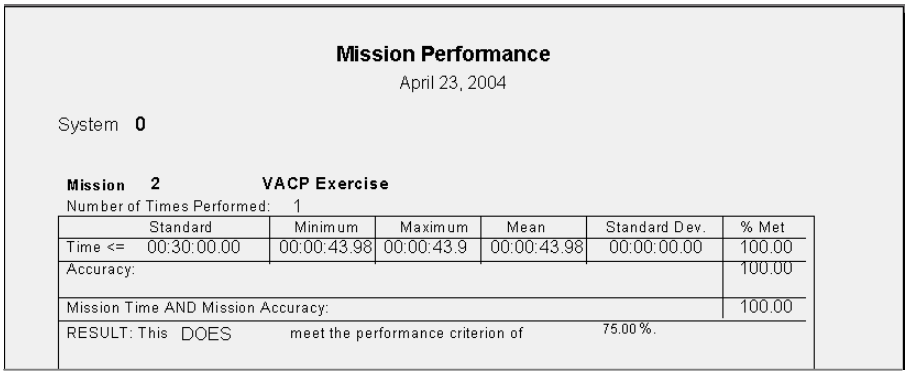
Change "Training Frequency" to - **Less than twice per year**

Select “Apply”, then “Review”. When finished reviewing the data select “OK”, select “OK” again.



	Task	Accurac	Adj.Acc	Delta	Time	Adj.Time	Delta	Adj.Prob
1	Interpret data	90.00	90.00	0.00	00:00:15.00	00:00:15.00	00:00:00.00	97.73
2	Listen - Radio	90.00	90.00	0.00	00:00:06.00	00:00:06.00	00:00:00.00	97.73
3	Read - Hard Copy	90.00	88.88	-1.12	00:00:07.00	00:00:07.37	00:00:00.37	96.21
4	Read information	90.00	89.60	-0.40	00:00:14.00	00:00:15.32	00:00:01.32	97.25
5	Report	95.00	95.00	0.00	00:00:17.00	00:00:17.00	00:00:00.00	99.87
6	Resize and reorganize disp	50.00	49.13	-0.87	00:00:30.00	00:00:30.00	00:00:00.00	0.00
7	Send electronic message	90.00	88.63	-1.37	00:00:24.00	00:00:24.80	00:00:00.80	95.78
8	Speak	90.00	90.00	0.00	00:00:13.00	00:00:13.00	00:00:00.00	97.73
9	Speech message	90.00	90.00	0.00	00:00:10.00	00:00:10.00	00:00:00.00	84.13

Execute- with “PTS Adjustments” selected - use the same number of runs and random number. Look at results. Compare to baseline. Are there any changes?



Mission Performance

April 23, 2004

System **0**

Mission 2 VACP Exercise

Number of Times Performed: 1

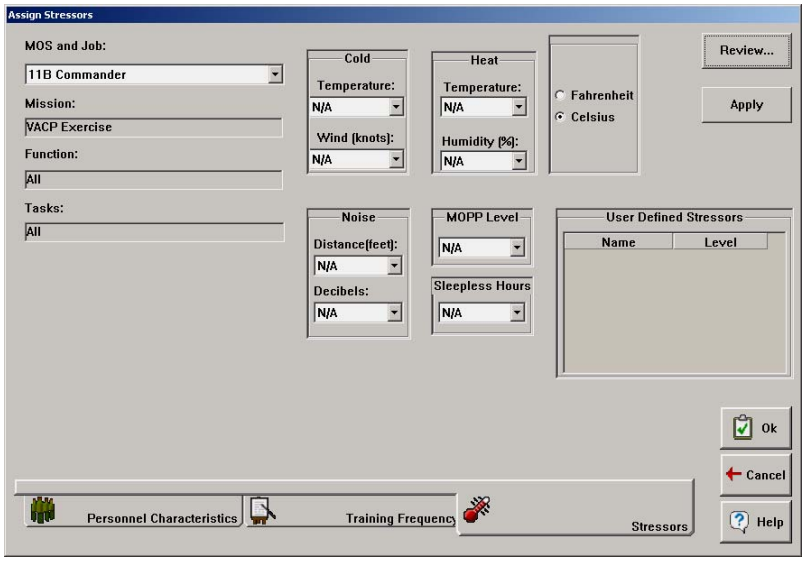
	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:43.98	00:00:43.9	00:00:43.98	00:00:00.00	100.00
Accuracy:						100.00
Mission Time AND Mission Accuracy:						100.00

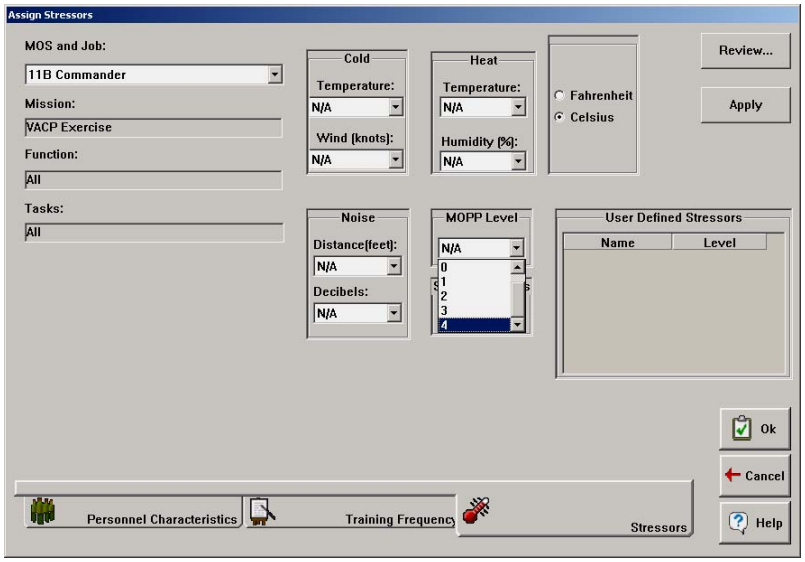
RESULT: This DOES meet the performance criterion of 75.00 %.

Stressors & Performance Shaping Function Exercise

Stressors

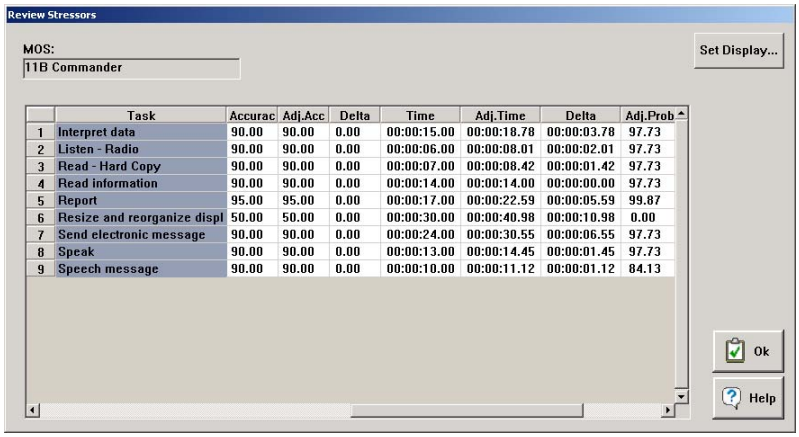
Select “Options/PTS/by MOS”. Select “Training Frequency” tab. Reapply original “Training Frequency” (“Once a Month”). (Remember to select apply twice!)
Select “Stressors” tab





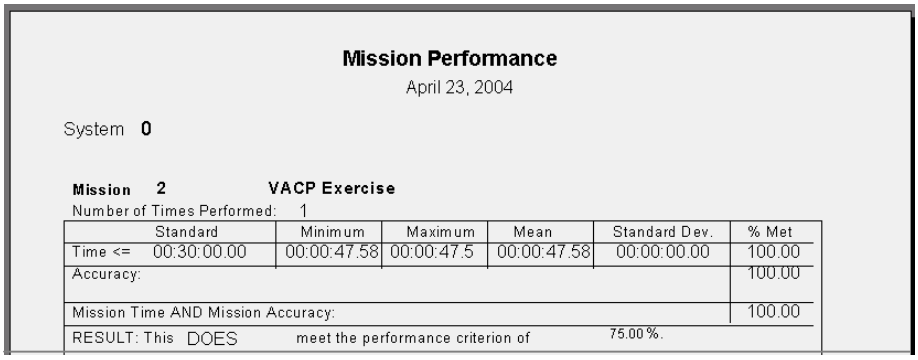
Set “MOPP Level” to **4**

Select “Apply”, then “Review”. When finished reviewing the data select “OK”, select ”OK” again.



	Task	Accurac	Adj.Acc	Delta	Time	Adj.Time	Delta	Adj.Prob
1	Interpret data	90.00	90.00	0.00	00:00:15.00	00:00:18.78	00:00:03.78	97.73
2	Listen - Radio	90.00	90.00	0.00	00:00:06.00	00:00:08.01	00:00:02.01	97.73
3	Read - Hard Copy	90.00	90.00	0.00	00:00:07.00	00:00:08.42	00:00:01.42	97.73
4	Read information	90.00	90.00	0.00	00:00:14.00	00:00:14.00	00:00:00.00	97.73
5	Report	95.00	95.00	0.00	00:00:17.00	00:00:22.59	00:00:05.59	99.87
6	Resize and reorganize displ	50.00	50.00	0.00	00:00:30.00	00:00:40.98	00:00:10.98	0.00
7	Send electronic message	90.00	90.00	0.00	00:00:24.00	00:00:30.55	00:00:06.55	97.73
8	Speak	90.00	90.00	0.00	00:00:13.00	00:00:14.45	00:00:01.45	97.73
9	Speech message	90.00	90.00	0.00	00:00:10.00	00:00:11.12	00:00:01.12	84.13

Execute- with “PTS Adjustments” selected - use same number of runs and random number. Look at results. Compare to baseline. Are there any changes?



Mission Performance

April 23, 2004

System **0**

Mission 2 VACP Exercise

Number of Times Performed: 1

Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <= 00:30:00.00	00:00:47.58	00:00:47.5	00:00:47.58	00:00:00.00	100.00
Accuracy:					100.00
Mission Time AND Mission Accuracy:					100.00

RESULT: This DOES meet the performance criterion of 75.00 %.

⇒ What happens if you decrease/increase “CutOff”?

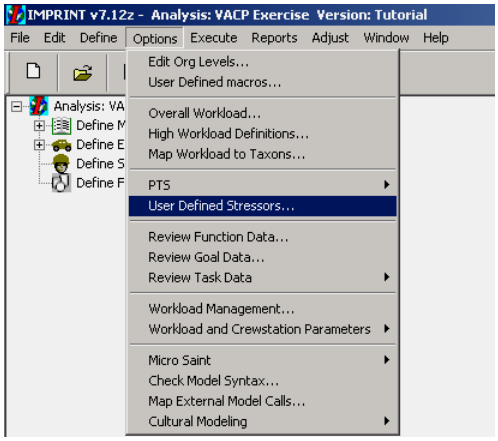
⇒ What happens if you decrease /increase “Training Frequency”?

⇒ How does applying **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors affect your performance?

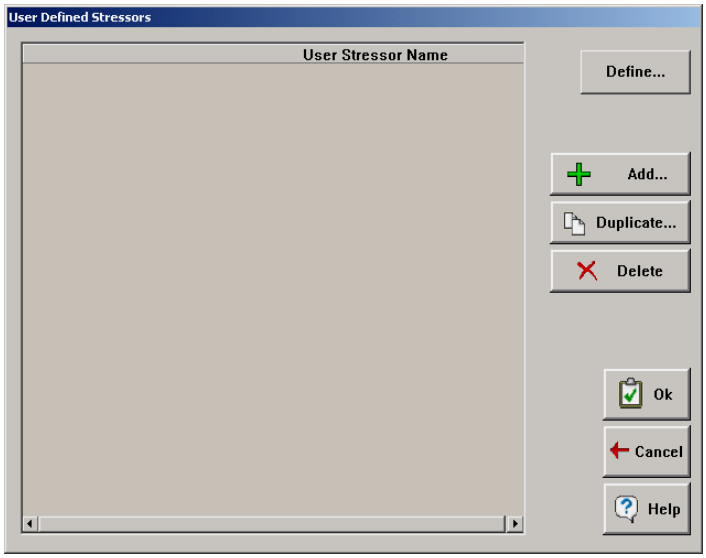
User Defined Stressors

Version 7 now allows you to define your own stressors. If the VACP Exercise is not opened, open it now by going to "File/Open" and select the analysis. Once you open the analysis, select "Define/System Mission" from the menu bar or "Define System" from the hierarchical tree on the Main screen. Then select your mission and then select "Open". Select "OK" until you are back to the Main screen.

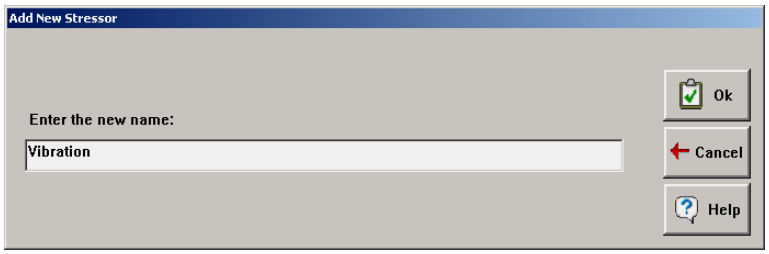
To define your own stressors select "User Defined Stressors…" from the "Options" menu.



You will see the User Defined Stressors screen.

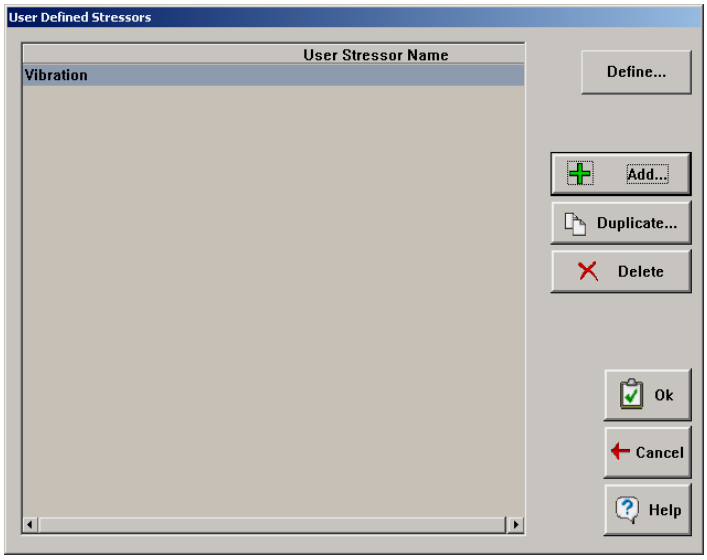


Select "Add" and enter a stressor name on the Add New Stressor screen.

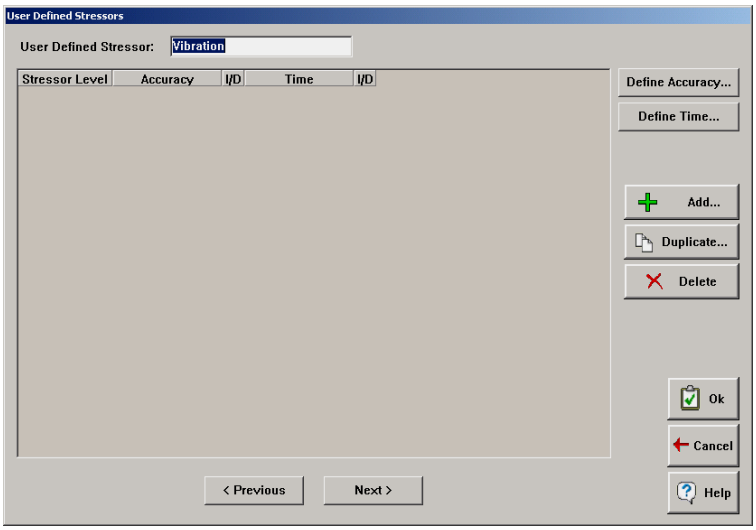


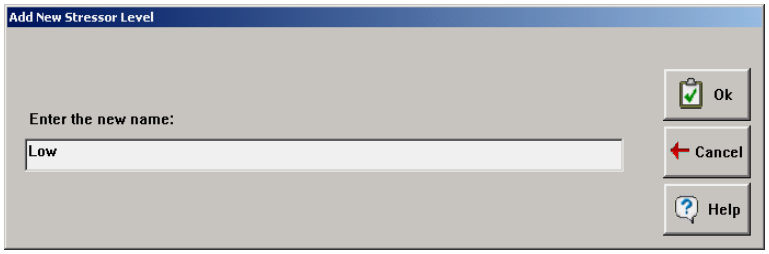
Enter the new name: **Vibration**
Select "OK".

You will now see the stressor name on the User Defined Stressors screen.
Select "Define".



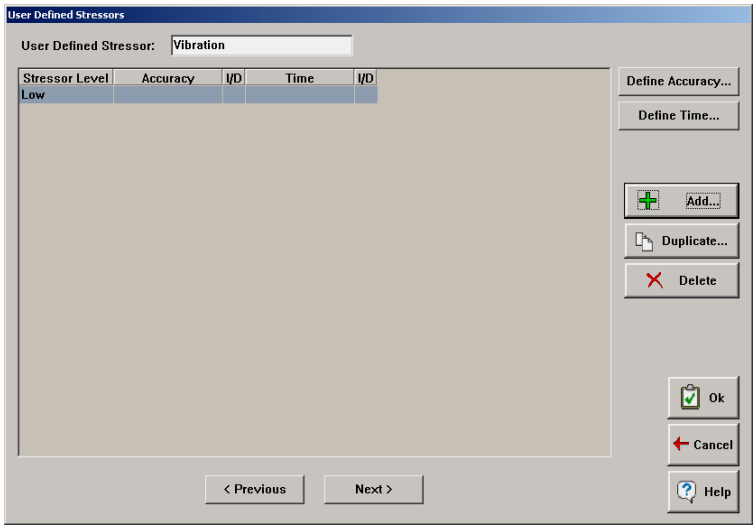
Before you can define either time or accuracy you must first create a "Stressor Level". To do this select "Add…".





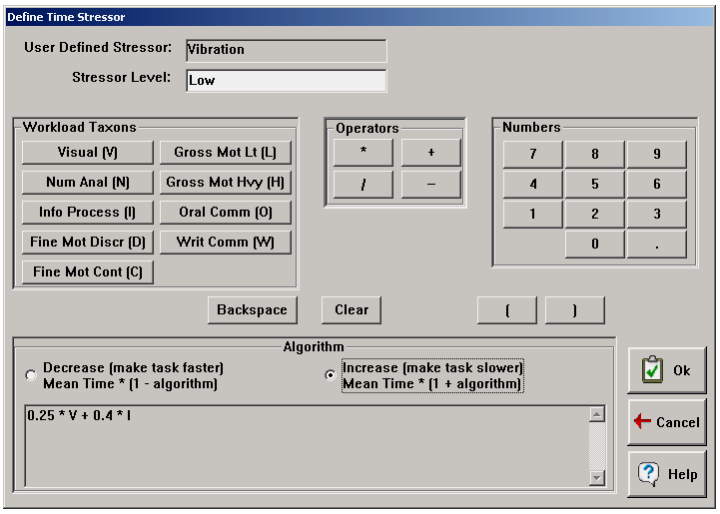
Enter the new name: **Low**
Select "OK"

You can now define accuracy and/or time. For this exercise you will select "Define Time…"



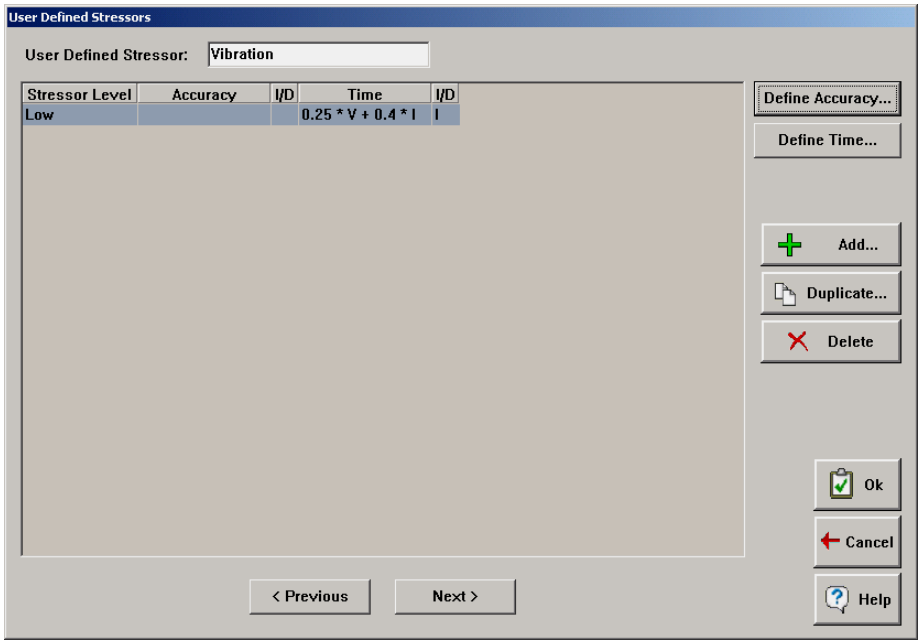
To define your algorithm create an equation using the buttons provided on the interface. Decimal points must follow a number. Operators must follow a number or workload taxon. The workload taxons you enter into the equation refer to the weights given to the taxons in individual tasks.

To enter the algorithm for "Stressor Level" - "Low" –



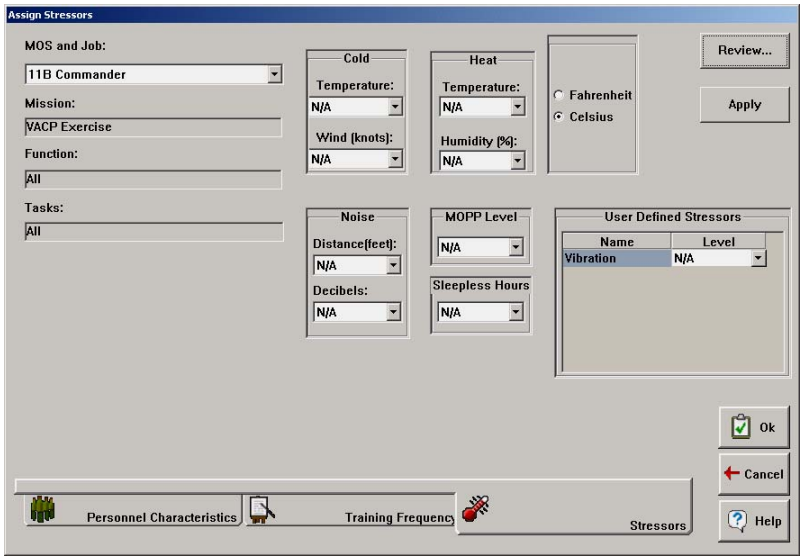
Select "**0**"
Select "**.**"
Select "**2**"
Select "**5**"
Select "*****"
Select "**Visual (V)**"
Select "**+**"
Select "**0**"
Select "**.**"
Select "**4**"
Select "*****"
Select "**Info Process (I)**"
Select "**Increase (make task slower) Mean Time * (1 + algorithm)**"
Select "OK"

When finished you should see the following -

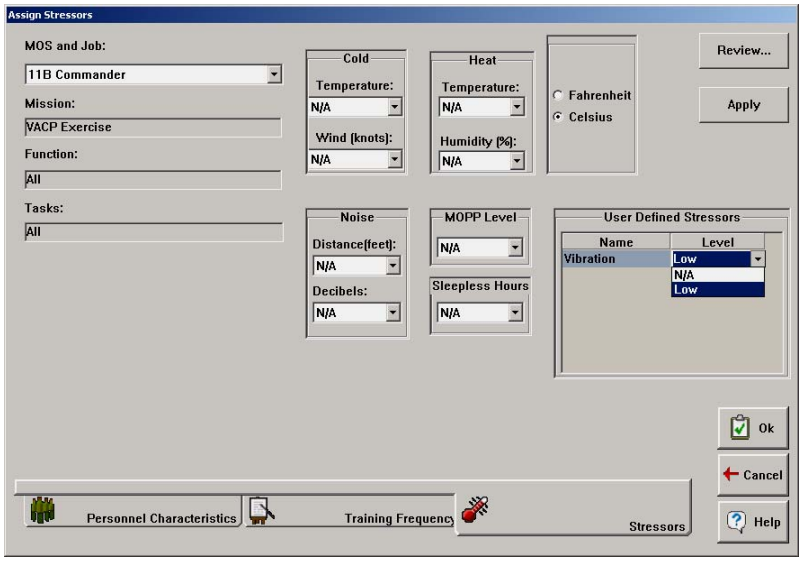


Select "OK" until you are back to the Main screen.
If you wanted to look at accuracy then you would select "Define Accuracy…" and go through the same steps to enter your algorithm for accuracy.

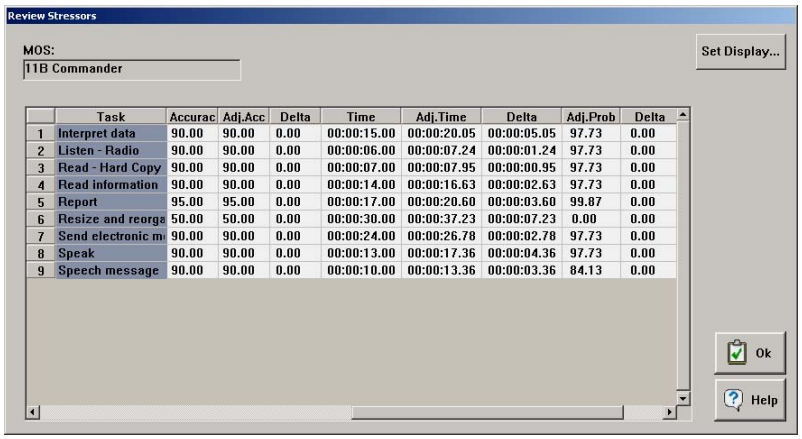
To use your stressor you need to select "Options/PTS/by MOS" or by Tasks". In this case we are looking at stressors by MOS. Select "Stressors" tab



You will notice that you now have an entry under "User Defined Stressors".

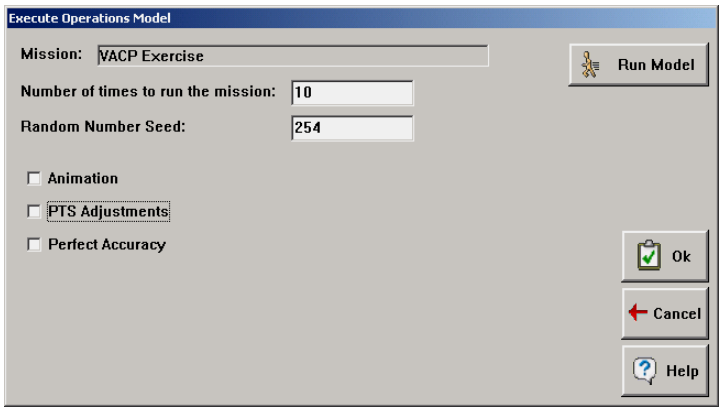


Set "Level" to **Low**
Select "Apply"
Select "Review…"



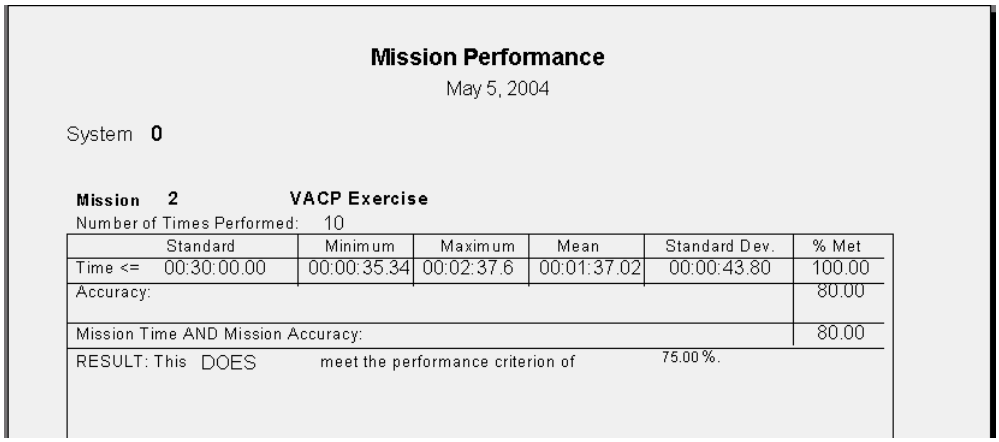
	Task	Accurac	Adj.Acc	Delta	Time	Adj.Time	Delta	Adj.Prob	Delta
1	Interpret data	90.00	90.00	0.00	00:00:15.00	00:00:20.05	00:00:05.05	97.73	0.00
2	Listen - Radio	90.00	90.00	0.00	00:00:06.00	00:00:07.24	00:00:01.24	97.73	0.00
3	Read - Hard Copy	90.00	90.00	0.00	00:00:07.00	00:00:07.95	00:00:00.95	97.73	0.00
4	Read information	90.00	90.00	0.00	00:00:14.00	00:00:16.63	00:00:02.63	97.73	0.00
5	Report	95.00	95.00	0.00	00:00:17.00	00:00:20.60	00:00:03.60	99.87	0.00
6	Resize and reorga	50.00	50.00	0.00	00:00:30.00	00:00:37.23	00:00:07.23	0.00	0.00
7	Send electronic m	90.00	90.00	0.00	00:00:24.00	00:00:26.78	00:00:02.78	97.73	0.00
8	Speak	90.00	90.00	0.00	00:00:13.00	00:00:17.36	00:00:04.36	97.73	0.00
9	Speech message	90.00	90.00	0.00	00:00:10.00	00:00:13.36	00:00:03.36	84.13	0.00

Select "OK".
Select "Execute/Run Operations Model…"



Number of time to run the mission: 10
Random Number Seed: **254**

Be sure that you have NOT selected "PTS Adjustments" and then select "Run Model". When finished select "OK" and select "Reports/Operations Results…" and look at the "Mission Performance" report. You might want to save it so you can compare it to the results you get after you run it using your stressor.



Mission Performance

May 5, 2004

System **0**

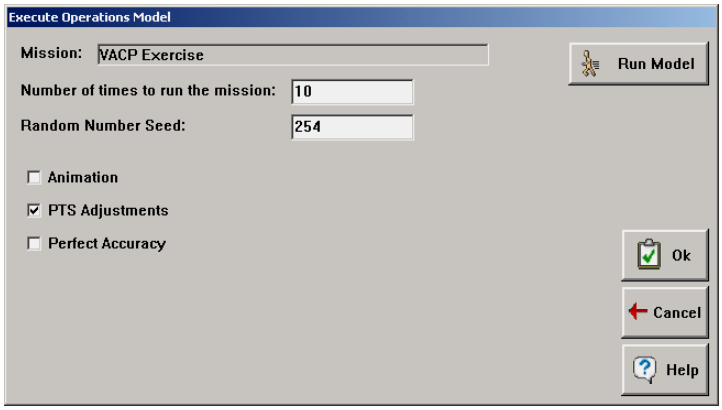
Mission 2 VACP Exercise

Number of Times Performed: 10

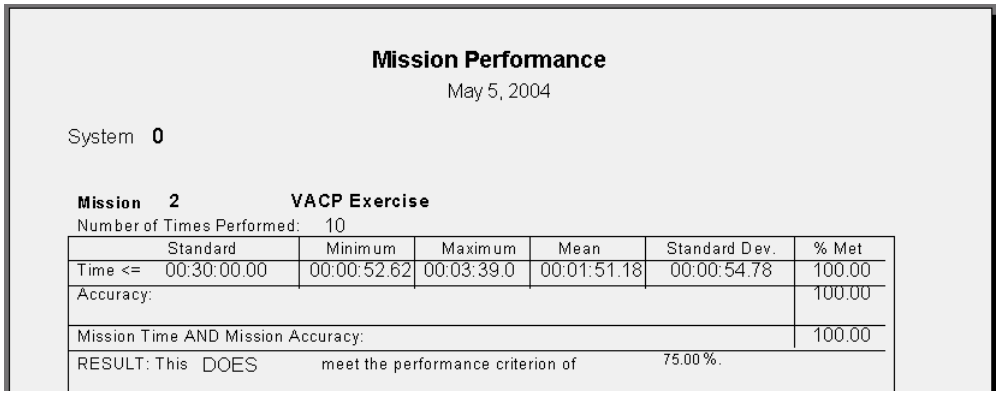
	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:35.34	00:02:37.6	00:01:37.02	00:00:43.80	100.00
Accuracy:						80.00
Mission Time AND Mission Accuracy:						80.00

RESULT: This DOES meet the performance criterion of 75.00 %.

Now go back to Execute/Run Operations Model…"



This time be sure that you do select "PTS Adjustments" and then select "Run Model". When finished select "OK" and select "Reports/Operations Results…" and look at the "Mission Performance" report and compare it to the previous results.



Mission Performance

May 5, 2004

System **0**

Mission 2 VACP Exercise

Number of Times Performed: 10

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:00:52.62	00:03:39.0	00:01:51.18	00:00:54.78	100.00
Accuracy:						100.00
Mission Time AND Mission Accuracy:						100.00

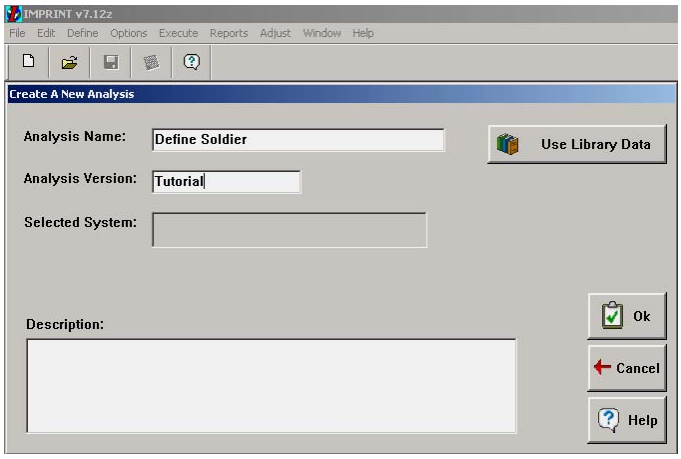
RESULT: This DOES meet the performance criterion of 75.00 %.

Define Soldier Exercise

For more information see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

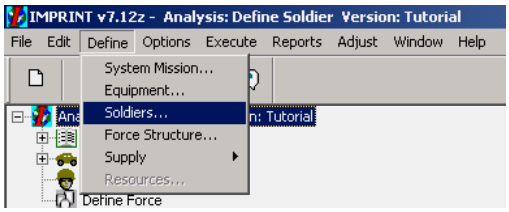
In this exercise we are using "Define Soldier" in standalone mode. Therefore, we are creating a new analysis. However, you will want to use "Define Soldier" when creating operator and maintenance models.

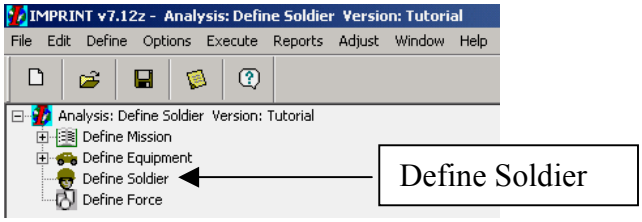
Create a new analysis.



Analysis Name: **Define Soldier**
Analysis Version: **Tutorial**

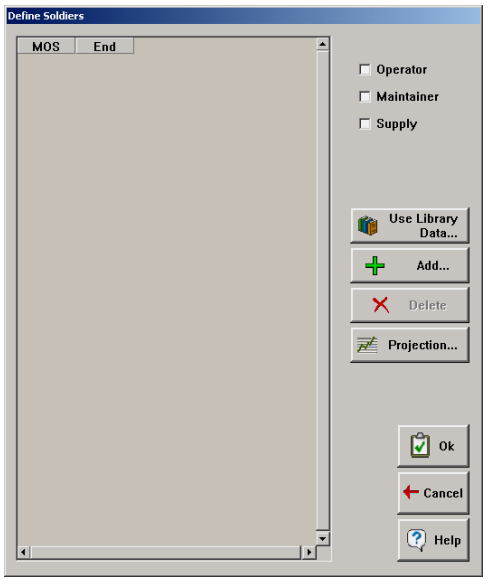
Select "Define/Soldier…" from the "Define" menu or select "Define Soldier" from the hierarchical tree on the Main screen.



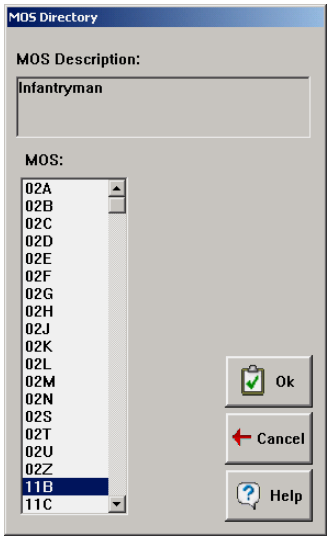


Define Soldier Exercise

When you get to the Define Soldier screen select "Add…"

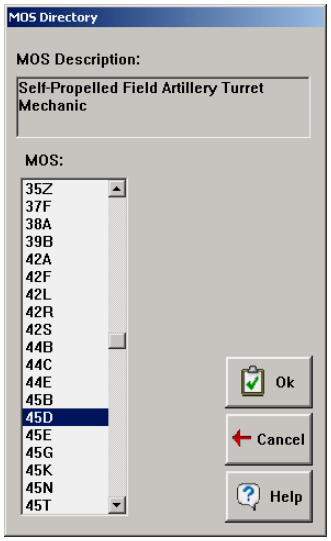


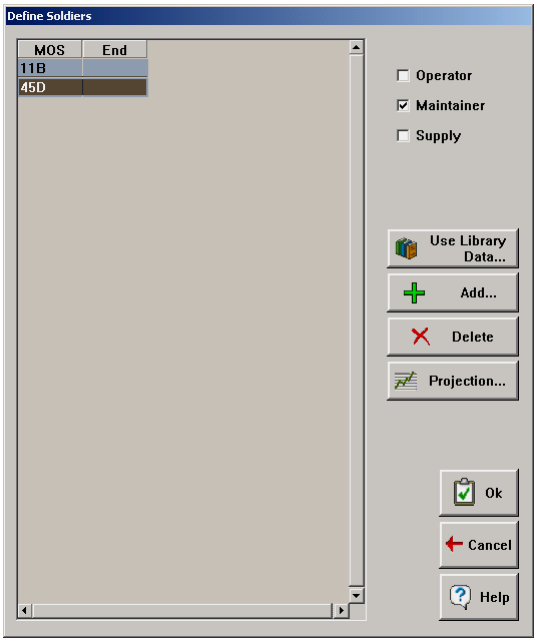
On the MOS Directory screen, select MOS "11B", select "OK". "Operator" is automatically selected on the Define Soldier screen.



Define Soldier Exercise

Select “Add…” again, select MOS “45D”, select “OK”. “Maintainer” ” is automatically selected on the Define Soldier screen.

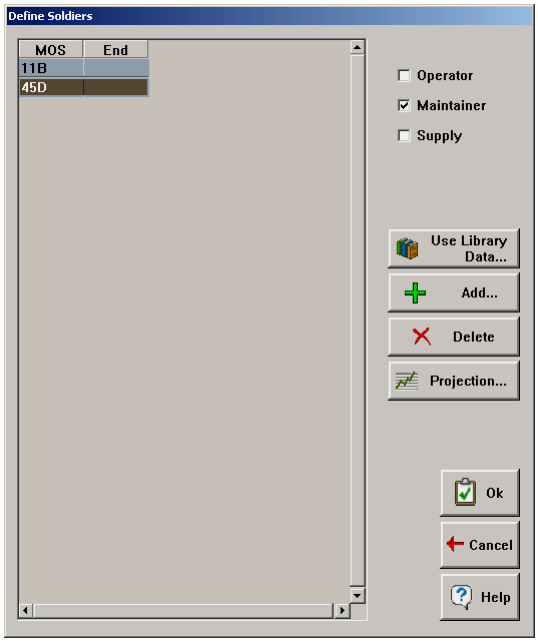




***Note:** You can select more than one type of MOS (Operator, Maintainer, Supply). The MOS you select can be all three types and will be listed under all three areas.

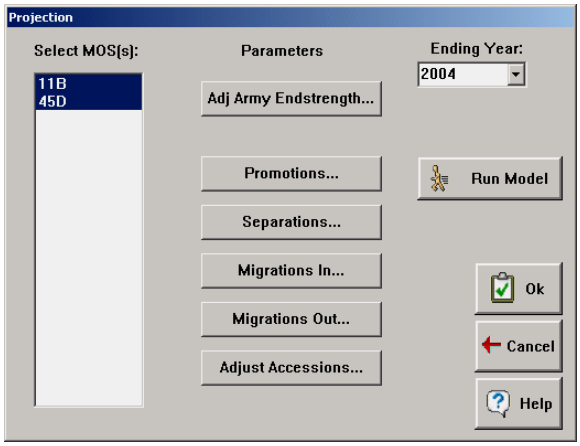
Projections

On the Define Soldiers screen, select “Projection…”



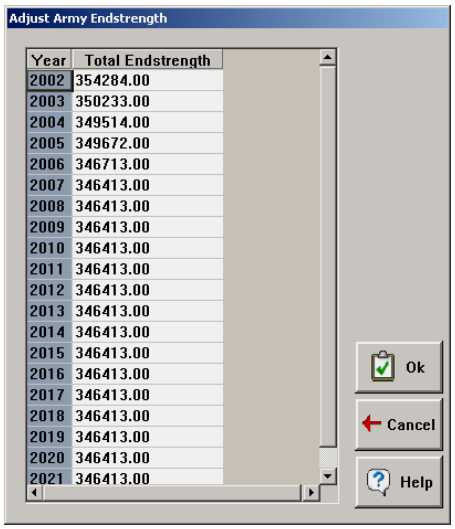
Define Soldier Exercise

Select both MOSs and look at the different parameters.



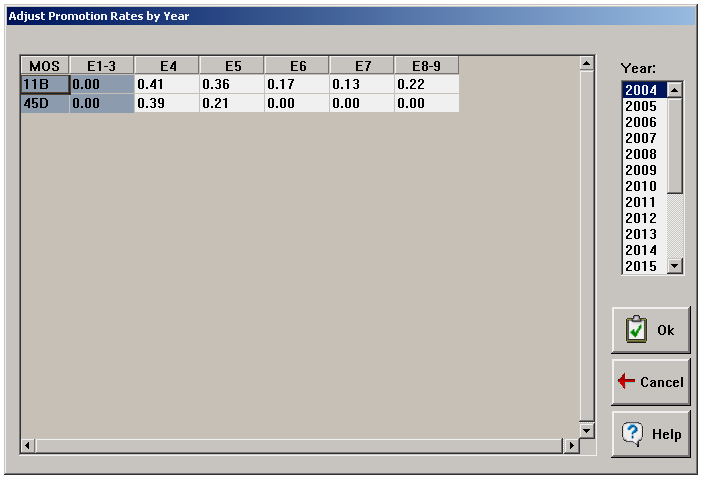
Look at:

"Adj. Army Endstrength…"



Total number in Army at time Enlisted Master File was imported (2002) into IMPRINT.
Select "OK"

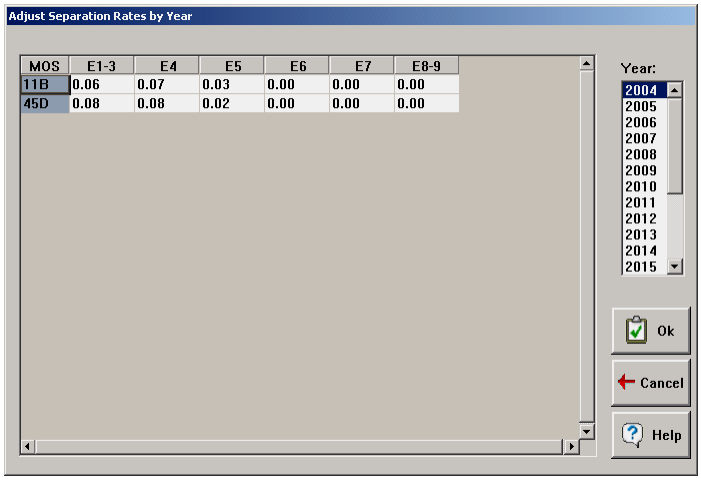
"Promotions…"



% promoted to rank E4 – E9
Select "OK"

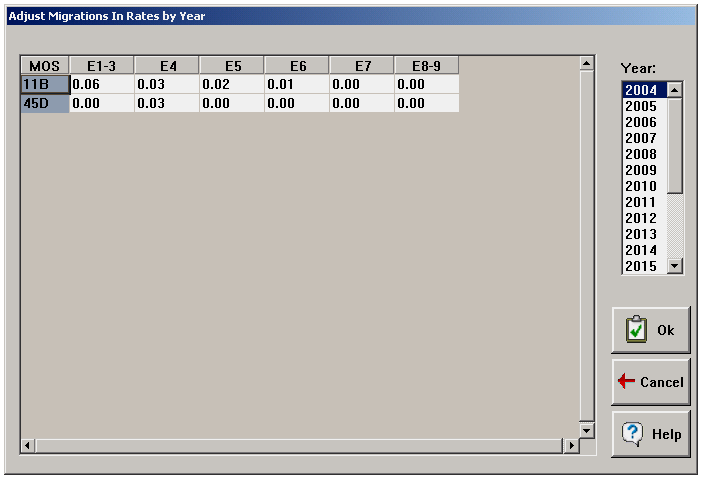
Define Soldier Exercise

"Separations…"



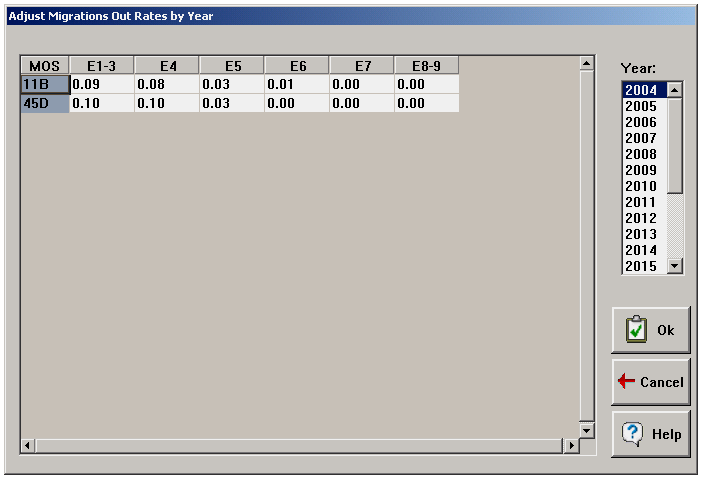
% leaving Army.
Select "OK"

"Migrations In…"



% coming from another MOS
Select "OK"

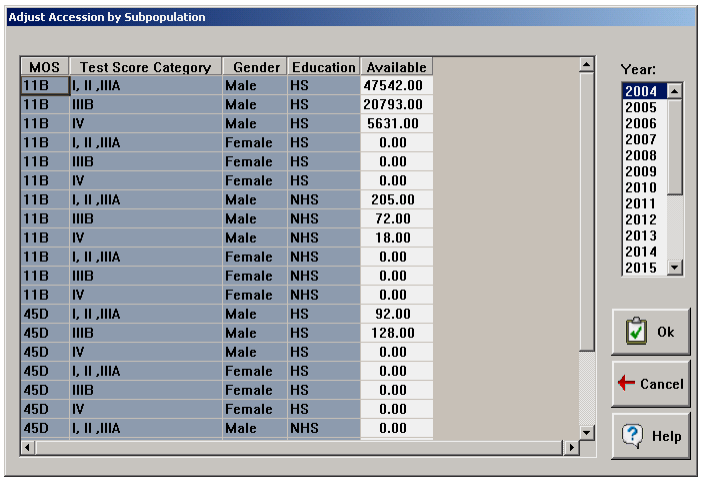
"Migrations Out…"



% going to another MOS
Select "OK"

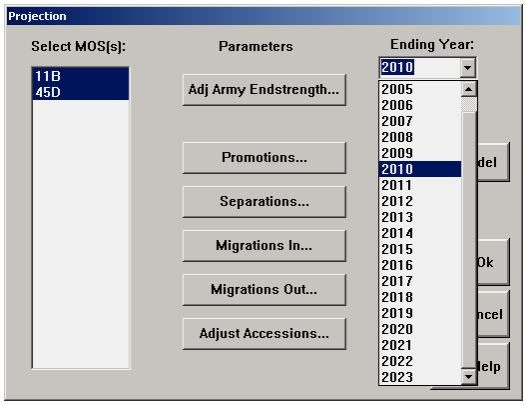
Define Soldier Exercise

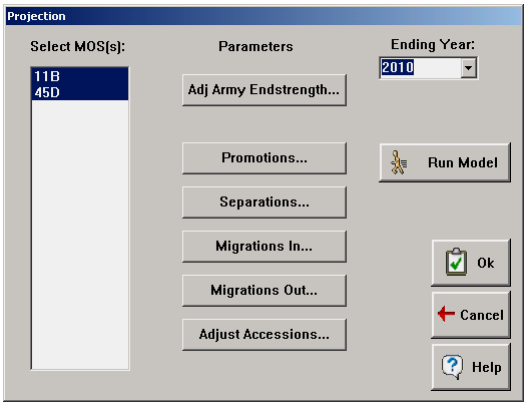
"Adjust Accessions…"



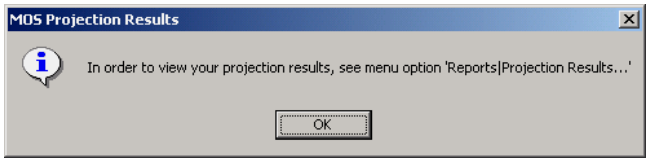
Number available in the general population. Select "OK"

Back on the Projection screen, select "Ending Year" - **2010**, then select "Run Model"



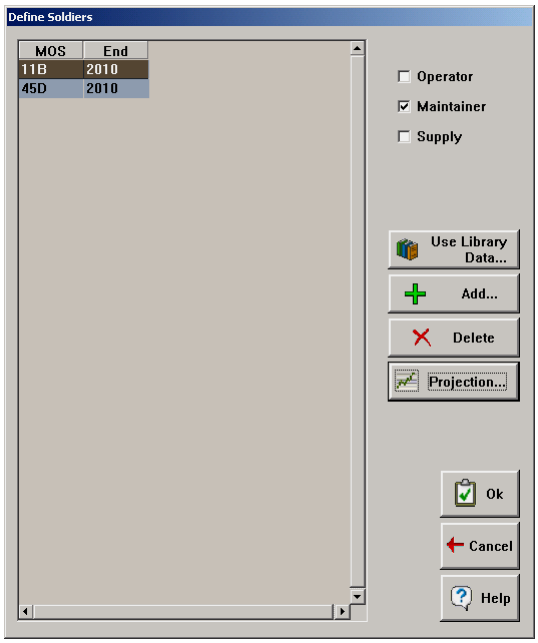


When finished you will see a dialog box informing you that you may view your projection reports by using the menu option "Reports/Projection Results…". Select 'OK" and select "OK" again to get back to the Define Soldiers screen.

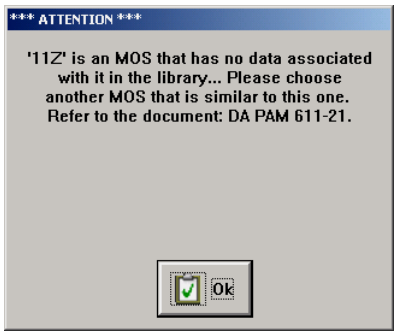


Define Soldier Exercise

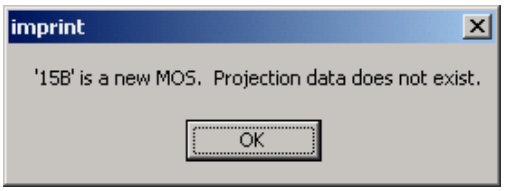
Notice that the "End" field now has date. This is the "Ending Year" selected on the Projection screen. Select "OK" and go to "Reports".



There are some MOSs in the library that have no data associated with it. If you should select such an MOS you will see the following when you select any of the parameters –



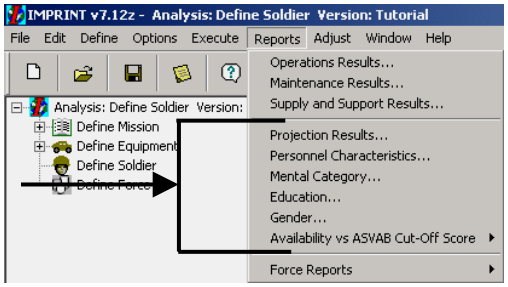
When you run the projection model you may see one or both of this kind of message –



This is NOT an error. It just means that there was no data available for these MOSs a the time IMPRINT imported the data from the Enlisted Master File. Therefore there will be no reports generated for these MOSs.

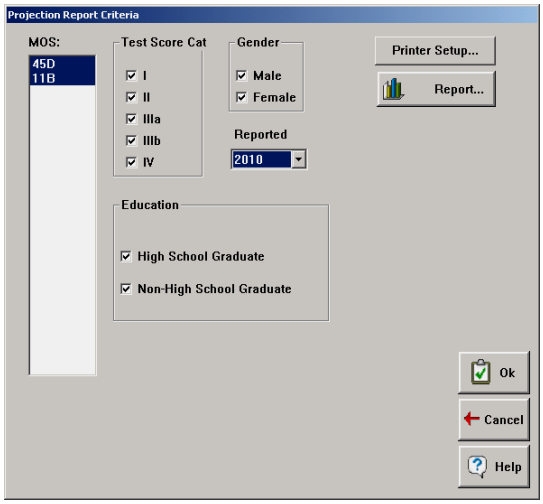
Define Soldier Exercise

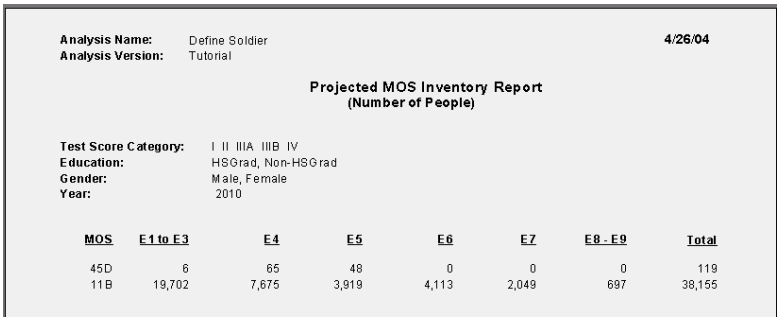
Define Soldier - Reports.



For each of the reports you can select the parameters that are of interest.

"Projection Results…" Use this report to get the number of people in each MOS by grade.





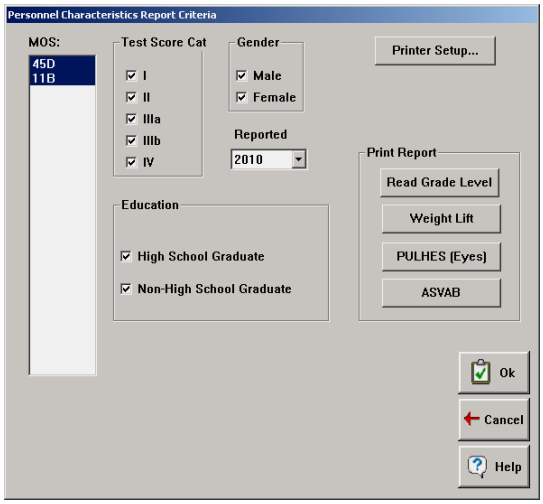
Analysis Name: Define Soldier
Analysis Version: Tutorial
4/26/04

Projected MOS Inventory Report
(Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

MOS	E1 to E3	E4	E5	E6	E7	E8 - E9	Total
45D	6	65	48	0	0	0	119
11B	19,702	7,675	3,919	4,113	2,049	697	38,155

"Personnel Characteristics…" Use this report to get a list of the numbers of soldiers in each MOS that have specific personnel characteristic levels. Use the buttons to select the characteristic for which you want to view a report.



Define Soldier Exercise

Reading Grade Level

Analysis Name: Define Soldier
Analysis Version: Tutorial
4/26/04

IMPRINT Personnel Characteristics Distribution Report
Reading Grade Level (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

		< 7	7 - 8	9 - 10	11 - 12	> 12	Total
	E1 - E3	213	4,860	4,047	9,610	954	19,700
	E4	59	1,831	1,601	3,771	412	7,674
MOS:	E5	33	1,022	921	1,832	209	3,917
11B	E6	75	1,262	831	1,791	153	4,112
	E7	57	728	389	784	90	2,048
	E8 - E9	29	295	125	219	37	695
	Total	466	9,996	7,014	18,015	1,855	38,146

		< 7	7 - 8	9 - 10	11 - 12	> 12	Total
	E1 - E3	0	4	0	0	0	4
	E4	0	17	16	29	0	62
MOS:	E5	0	15	10	22	0	47
45D	E6	0	0	0	0	0	0
	E7	0	0	0	0	0	0
	E8 - E9	0	0	0	0	0	0
	Total	0	36	26	51	0	113

Weight Lift

Analysis Name: Define Soldier
Analysis Version: Tutorial
4/26/04

IMPRINT Personnel Characteristics Distribution Report
Weight Lift (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

		Light	Medium	Heavy	Total
	E1 - E3	22	3,382	16,297	19,701
	E4	10	1,322	6,342	7,674
MOS:	E5	3	676	3,239	3,918
11B	E6	0	706	3,406	4,112
	E7	0	351	1,698	2,049
	E8 - E9	0	121	576	697
	Total	35	6,558	31,558	38,151

		Light	Medium	Heavy	Total
	E1 - E3	0	0	5	5
	E4	0	12	53	65
MOS:	E5	0	8	40	48
45D	E6	0	0	0	0
	E7	0	0	0	0
	E8 - E9	0	0	0	0
	Total	0	20	98	118

PULHES

Analysis Name: Define Soldier
Analysis Version: Tutorial
4/26/04

IMPRINT Personnel Characteristics Distribution Report
PULHES: Eyes (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2004

		1	2	> 2	Total
	E1 - E3	16,226	4,842	0	21,068
	E4	5,902	1,772	0	7,674
MOS:	E5	3,018	900	0	3,918
11B	E6	3,184	928	0	4,112
	E7	1,592	457	0	2,049
	E8 - E9	544	152	0	696
	Total	30,466	9,051	0	39,517

		1	2	> 2	Total
	E1 - E3	51	14	0	65
	E4	42	12	0	54
MOS:	E5	29	8	0	37
45D	E6	0	0	0	0
	E7	0	0	0	0
	E8 - E9	0	0	0	0
	Total	122	34	0	156

ASVAB

Analysis Name: Define Soldier
Analysis Version: Tutorial
4/26/04

IMPRINT Personnel Characteristics Distribution Report
ASVAB (Number of People)

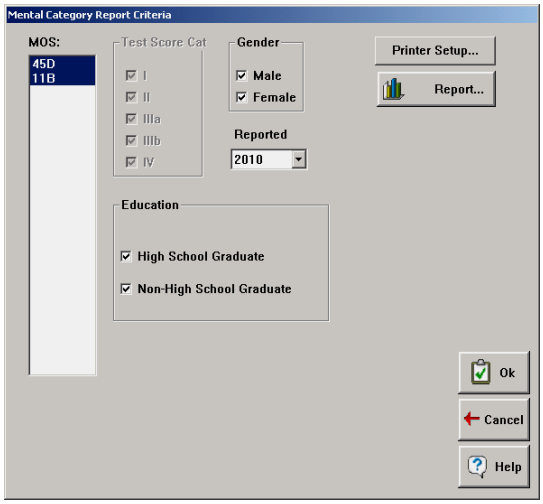
Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2004

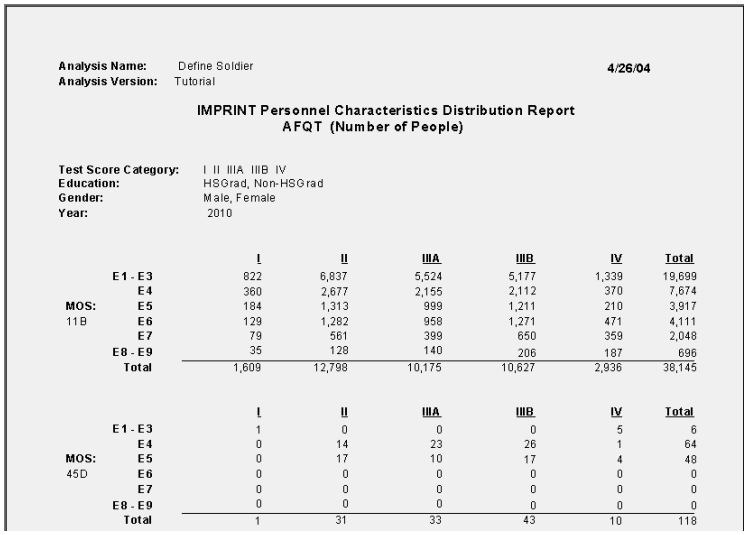
		< 75	75 - 84	85 - 94	95 - 104	105 - 114	115 - 124	125 - 134	Total
	E1 - E3	99	903	2,912	5,090	6,085	4,106	1,033	21,028
	E4	32	294	1,017	1,859	2,537	1,522	396	7,657
MOS:	E5	18	165	553	969	1,261	748	197	3,911
11B	E6	26	238	680	1,033	1,248	712	170	4,107
	E7	17	152	389	516	567	321	84	2,046
	E8 - E9	7	68	156	178	160	90	27	694
	Total	199	1,820	5,707	9,645	12,666	7,499	1,907	39,443

		< 75	75 - 84	85 - 94	95 - 104	105 - 114	115 - 124	125 - 134	Total
	E1 - E3	1	6	12	19	16	7	1	62
	E4	0	3	8	16	16	7	1	51
MOS:	E5	0	3	6	10	10	5	1	35
45D	E6	0	0	0	0	0	0	0	0
	E7	0	0	0	0	0	0	0	0
	E8 - E9	0	0	0	0	0	0	0	0
	Total	1	12	26	45	42	19	3	148

Define Soldier Exercise

"Mental Category…" Use this report to get a list of the numbers of soldiers in each MOS that have specific mental category levels.





Analysis Name: Define Soldier 4/26/04
Analysis Version: Tutorial

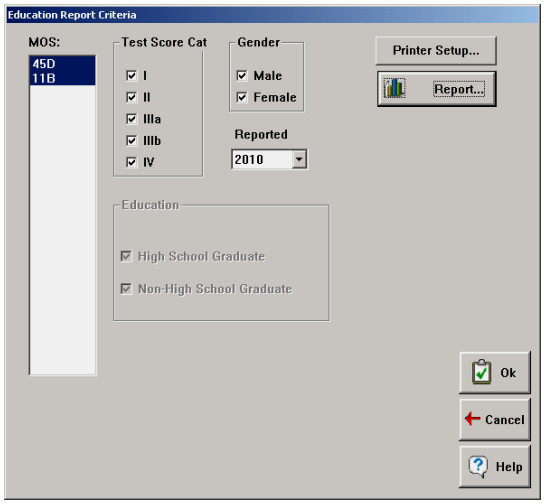
IMPRINT Personnel Characteristics Distribution Report
AFQT (Number of People)

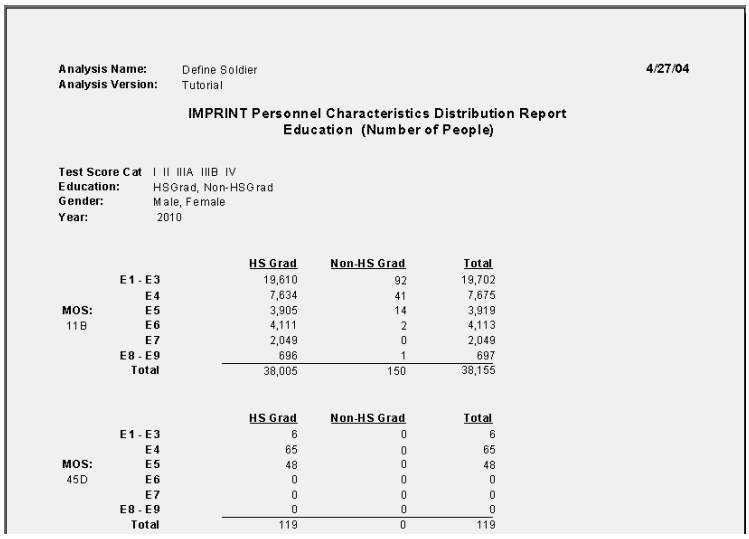
Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

		I	II	IIIA	IIIB	IV	Total
MOS: 11B	E1 - E3	822	6,837	5,524	5,177	1,339	19,699
	E4	360	2,677	2,155	2,112	370	7,674
	E5	184	1,313	999	1,211	210	3,917
	E6	129	1,282	958	1,271	471	4,111
	E7	79	561	399	650	359	2,048
	E8 - E9	35	128	140	206	187	696
	Total	1,609	12,798	10,175	10,627	2,936	38,145

		I	II	IIIA	IIIB	IV	Total
MOS: 45D	E1 - E3	1	0	0	0	5	6
	E4	0	14	23	26	1	64
	E5	0	17	10	17	4	48
	E6	0	0	0	0	0	0
	E7	0	0	0	0	0	0
	E8 - E9	0	0	0	0	0	0
	Total	1	31	33	43	10	118

"Education…" Use this report to get a list of the numbers of soldiers in each MOS that have specific education levels.





Analysis Name: Define Soldier 4/27/04
Analysis Version: Tutorial

IMPRINT Personnel Characteristics Distribution Report
Education (Number of People)

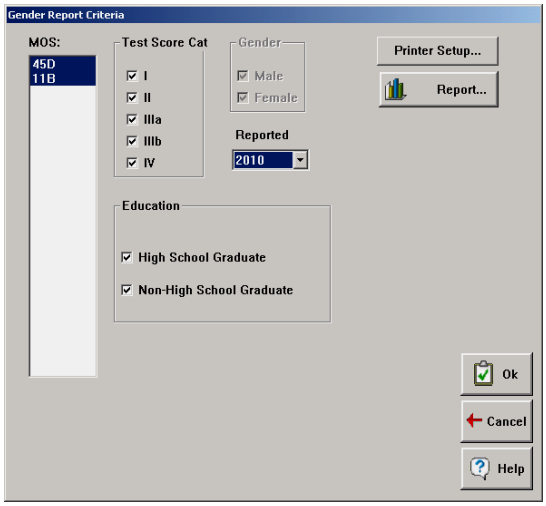
Test Score Cat I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

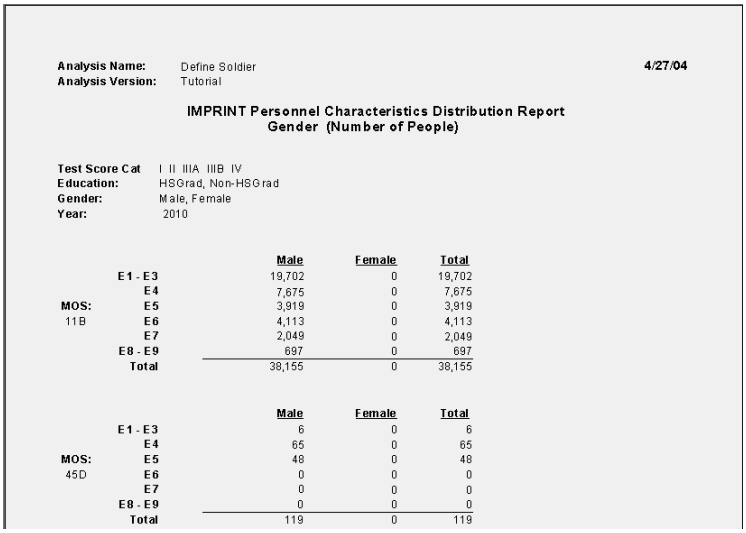
		HS Grad	Non-HS Grad	Total
MOS: 11B	E1 - E3	19,610	92	19,702
	E4	7,634	41	7,675
	E5	3,905	14	3,919
	E6	4,111	2	4,113
	E7	2,049	0	2,049
	E8 - E9	696	1	697
	Total	38,005	150	38,155

		HS Grad	Non-HS Grad	Total
MOS: 45D	E1 - E3	6	0	6
	E4	65	0	65
	E5	48	0	48
	E6	0	0	0
	E7	0	0	0
	E8 - E9	0	0	0
	Total	119	0	119

Define Soldier Exercise

"Gender…" Use this report to identify the number of soldiers in each MOS by gender, for each category you have checked.





Analysis Name: Define Soldier
Analysis Version: Tutorial
4/27/04

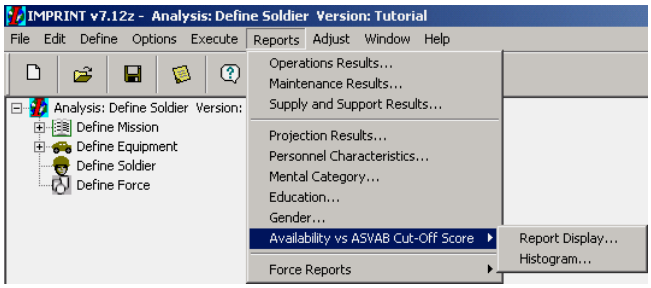
IMPRINT Personnel Characteristics Distribution Report
Gender (Number of People)

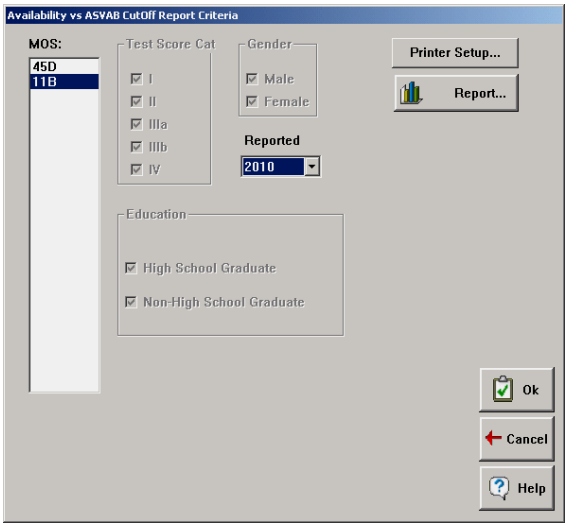
Test Score Cat I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2010

		Male	Female	Total
MOS: 11B	E1 - E3	19,702	0	19,702
	E4	7,675	0	7,675
	E5	3,919	0	3,919
	E6	4,113	0	4,113
	E7	2,049	0	2,049
	E8 - E9	697	0	697
	Total	38,155	0	38,155

		Male	Female	Total
MOS: 45D	E1 - E3	6	0	6
	E4	65	0	65
	E5	48	0	48
	E6	0	0	0
	E7	0	0	0
	E8 - E9	0	0	0
	Total	119	0	119

"Availability vs ASVAB Cutoff Score …" (Report/Histogram Display). Use this report to get numbers of soldiers in each MOS that have specific ASVAB Cutoff Levels. You can select the year and the MOS for which you want the data to be displayed. The report also provides the percentage of the population that is available under each cutoff score. You can also get a graphical view of these data by selecting the Histogram view on the cascading menu for this report item.





Define Soldier Exercise

Report

4/27/04

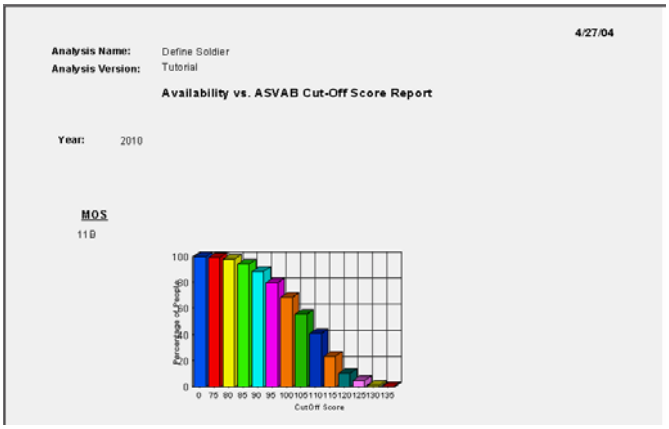
Analysis Name: Define Soldier
Analysis Version: Tutorial

Availability vs. ASVAB Cut-Off Score Report

Year: 2010

MOS	ASVAB Composite	ASVAB Cut-Off Score	Number Available	Percent Available
11B	CO	0	38,097	99.84
11B	CO	75	37,902	99.32
11B	CO	80	37,480	98.22
11B	CO	85	36,141	94.71
11B	CO	90	33,912	88.87
11B	CO	95	30,629	80.26
11B	CO	100	26,346	69.04
11B	CO	105	21,316	55.86
11B	CO	110	15,657	41.03
11B	CO	115	9,087	23.81
11B	CO	120	4,138	10.84
11B	CO	125	1,844	4.83
11B	CO	130	576	1.51
11B	CO	135	0	0.00

Histogram Display

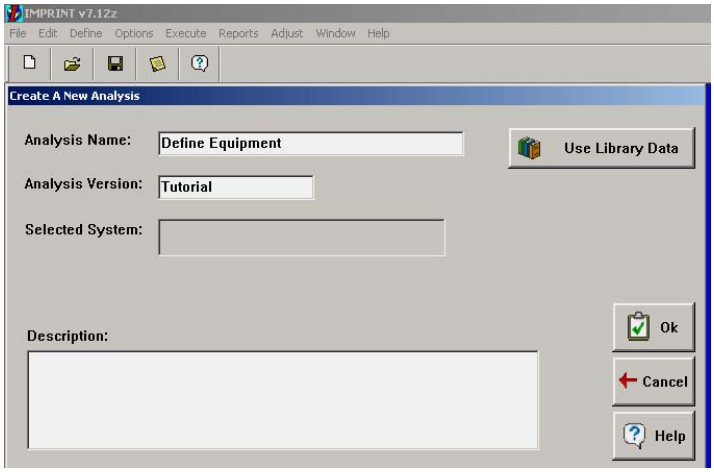


Define Equipment Exercise

Define Equipment helps you estimate maintenance manhour requirements for your system as well as help you estimate your system's reliability, availability, and maintainability (RAM). For more information, see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

Create a "New" analysis.

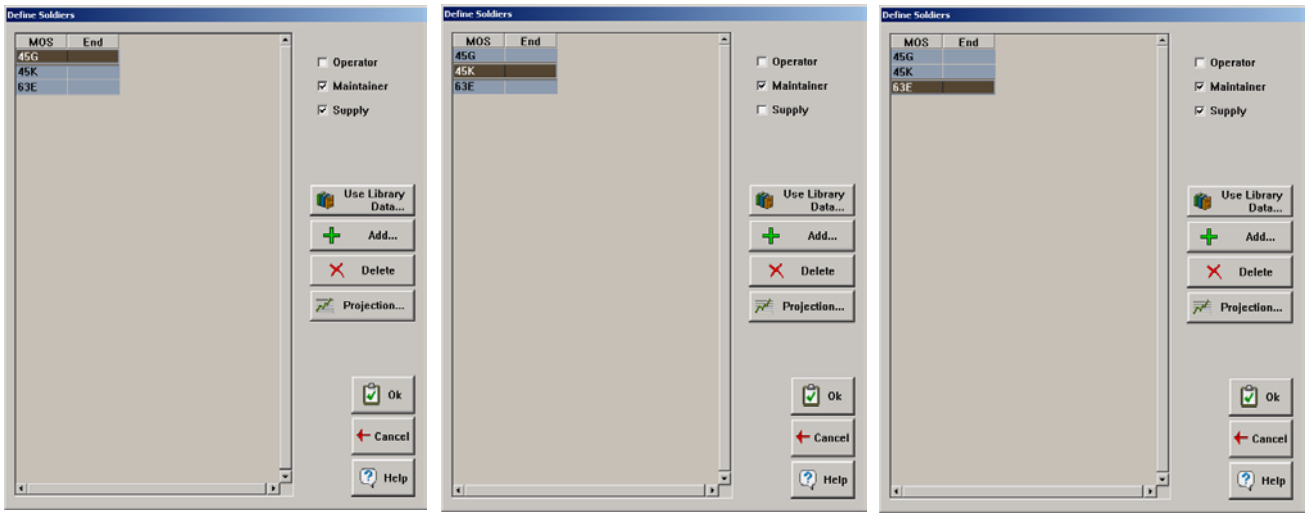
Use the "New" button or select "File/New" from the menu bar.



Analysis Name: **Define Equipment**
Analysis Version: **Tutorial**

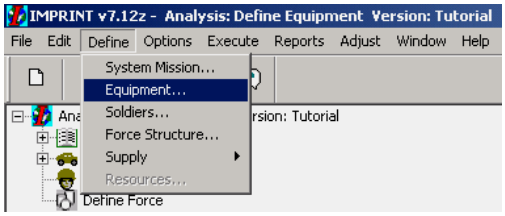
When finished select OK.

Select "Define/Soldiers…" add 3 MOSs – "45G", "45K", "63E".
(See "Define Soldier" on page 53 for information on how to add MOSs)
For this exercise all three are "Maintainer" MOSs and IMPRINT will automatically select "Maintainer". You will also select "Supply" for MOSs "63E" and "45G". (MOS "63E" and "45G" will be listed as maintainers under "Define Equipment" and will also be listed under "Define Supply", which you will see later in this section.)

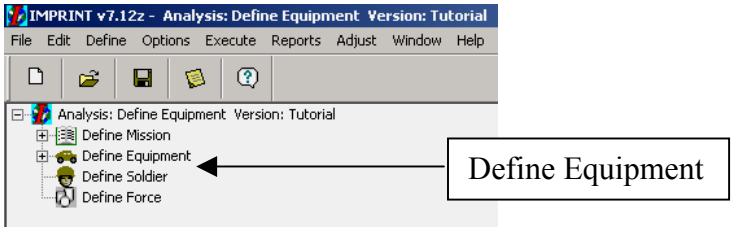


Define Equipment Exercise

When finished select "OK".
Select "Define/Equipment…" from the menu bar



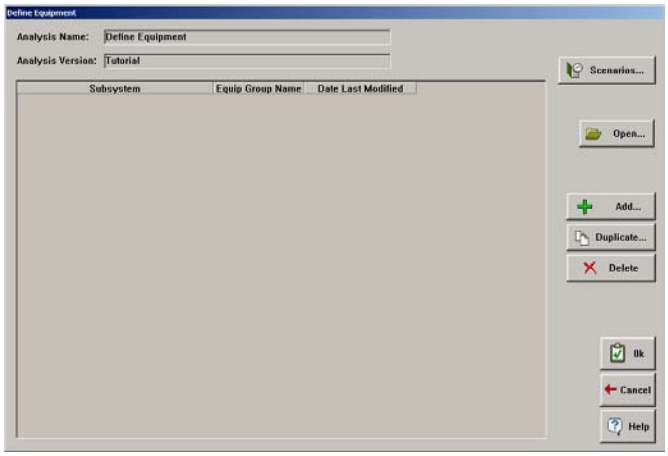
Or select "Define Equipment" from the hierarchical tree.



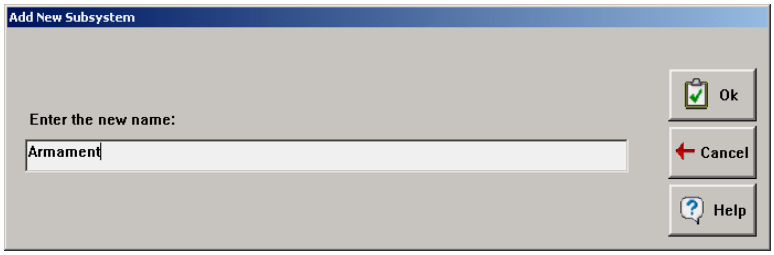
Use "Define Equipment Exercise Data Sheet" on page 112 for this exercise.

Adding Subsystems

Start adding the subsystems for your system. You will find the subsystem names under the "Subsystem" column on the "Define Equipment Exercise Data" sheet.



1. Select "Add…" and enter the first subsystem name,



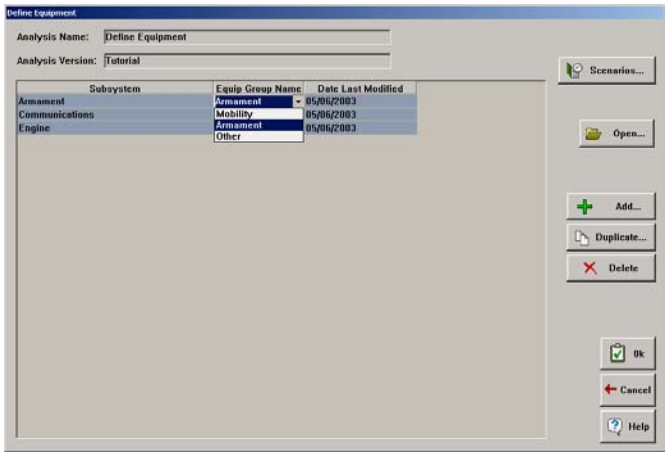
Define Equipment Exercise

2. Hit Enter then hit Enter again. This will bring up the "Add New Subsystem" entry screen again. Add the second subsystem.

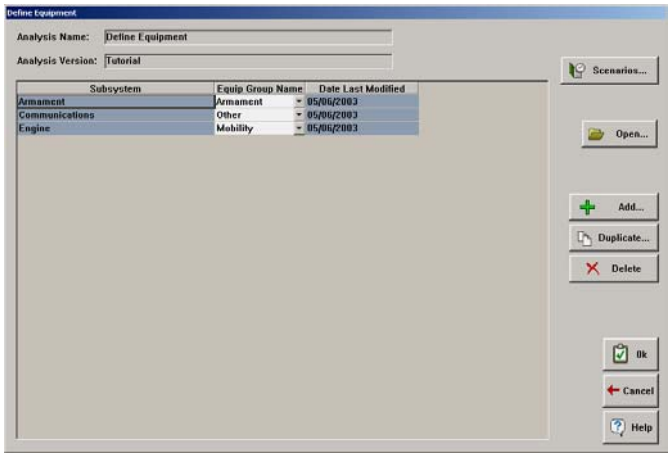
3. Hit Enter then hit Enter again. Now enter the third subsystem. If you had more subsystems, you would continue until all were entered.

When you finished you should have the following Subsystems: **Armament**, **Communications** and **Engine**.

When finished entering the subsystem enter the "Equip Group Name" listed under the "EquipGrp" column on the "Define Equipment Exercise Data" sheet.



Subsystem	*Equip Group Name*
Armament	**Armament**
Communications	**Other**
Engine	**Mobility**



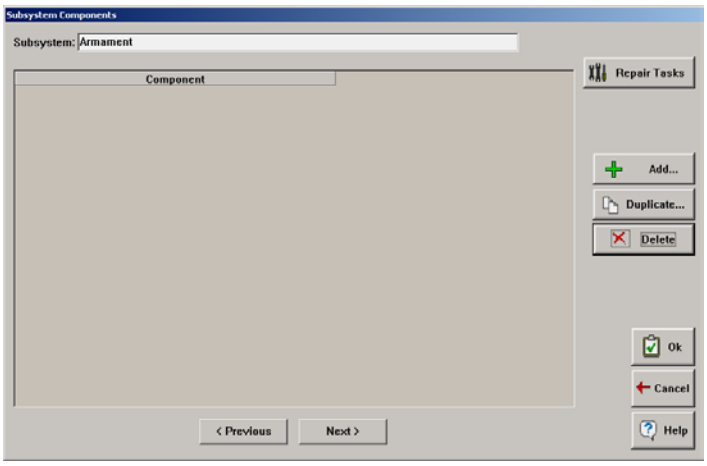
******Note:*** The "Equip Group Name" designates how the "MOUBF" ("Mean Operational Unit Between Failure" or more commonly known as "Mean Time Between Failure" (MTBF)) will be defined. If the subsystem is defined as "Armament" then the MOUBF will be in "Rounds" fired. If it is defined as "Mobility", then the MOUBF will be in "Distance" traveled. If it is defined as "Other" then the MOUBF will be in "Hours" (the amount of time that the system has been operating.)

After you have entered the last subsystem and made the "Equip Group Name" selections - Highlight the first subsystem (Armament) and select "Open".

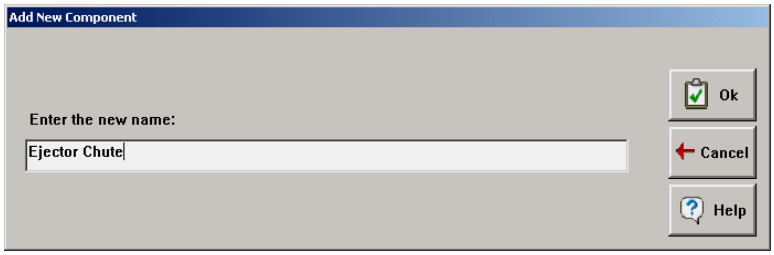
Define Equipment Exercise

Adding Components

Start adding the components for the selected subsystem. You will find the components associated with each subsystem under the "Component" column on the "Define Equipment Exercise Data" sheet.



1. Select "Add…" and enter the first component name.



2. Hit Enter then and hit Enter again. This will bring up another "Add New Component" entry screen. Add the next component.

3. Do this until you have entered all your components for the selected subsystem.

4. When finished entering the components for a subsystem you can select "Next". This will take you to the next subsystem on the list.

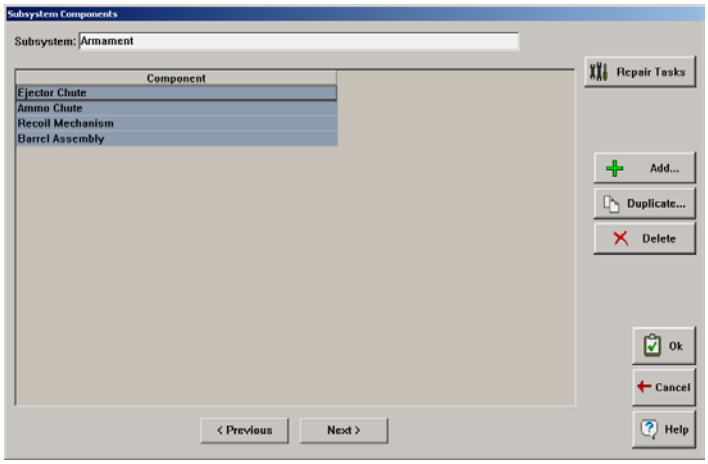
5. Go through steps 1 – 4 until you have entered all the components for all the subsystems.

When completed you should have the following Components for each Subsystem:
Armament: **Ejector Chute**; **Ammo Chute**; **Recoil Mechanism**; **Barrel Assembly**
Communications: **Rec/Trans**; **AM 1780 VRC**; **Communications**
Engine: **Starter**; **Fuel Pump**; **Engine, Other**

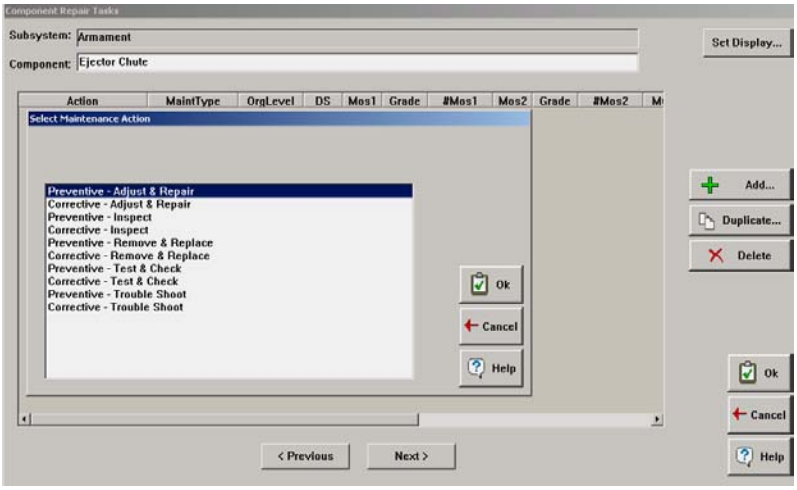
When you are finished entering all the components select the first subsystem (Armament) and begin entering the data for each component. You can do this by selecting the "Previous" button until you see the first subsystem listed in the "Subsystem" field on the Subsystem Components screen. You will find the repair task for each subsystem/component under the "Action/Maint Type" columns on the "Define Equipment Exercise Data" sheet.

Define Equipment Exercise

Highlight the first component (Ejector Chute) and select "List Repair Tasks" –



1. Select "Add" and select the first repair task for the first component.

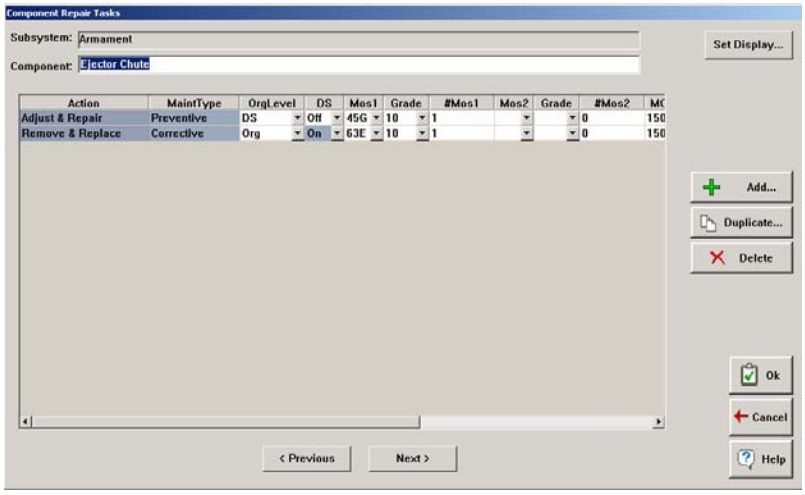


Select -
"Preventive – Adjust & Repair"

2. Select "OK".

3. Enter the data for the component's task. The required data can be found on the "Define Equipment Exercise Data Sheet" sheet on page 112. When finished entering the data for a component select "OK".

Define Equipment Exercise



All the fields are shown below.

Action	MaintType	OrgLevel	DS	Mos1	Grade	#Mos1	Mos2	Grade	#Mos2	MOUBF[Rounds]	MTTR	SD MTTR	Distribution	Abort%	ContactTeam
Adjust & Repair	Preventive	DS	Off	45G	10	1			0	150.00	00:01:30.00	00:00:00.00	Normal	0.00	No
Remove & Replace	Corrective	Org	On	63E	10	1			0	150.00	00:01:30.00	00:00:00.00	Normal	0.00	No

The required fields for each Component/Action/Maint Type are – "Org Level", "DS", "Mos1", "Grade", "#Mos1", "MOUBF" and "MTTR". In this exercise, you will also enter data in the "Abort%" field for some components. However, this information is not required.

******Note:*** The "OrgLevel" will always default to "Org" and the field "DS" will always be "On". (If a field is highlighted then you cannot edit that field.) There are defaults for the different levels.
"OrgLevel" "DS" defaults to "Off" but can be changed to "On".
"OrgLevel" "GS is set to "Off" and cannot be changed.

If the Org Level field is set to "Org" (unit) then the component is repaired "On" the equipment.

If the Org Level field is set to "DS" (direct support) then the component can be repaired "On" or "Off" the equipment.

If the Org Level field is set to "GS" (general support) then the component is always repaired "Off" equipment.

The "Org Level" influences how and when equipment is repaired in the model.

4. Do steps 1-3 for each task associated with the component.

5. When you are finished entering the data for a component, select OK, select "Next" to get to the next subsystem.

6. Do steps 1-5 until you have entered all the data for each subsystem/component.

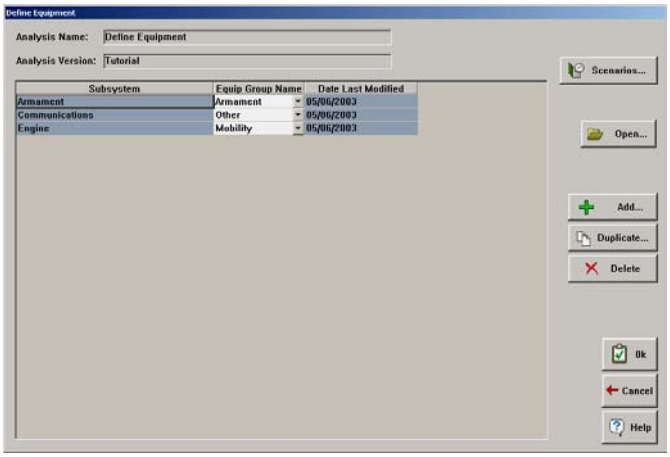
7. When finished, select "OK" on each screen until you are back to the Main screen and save your analysis.

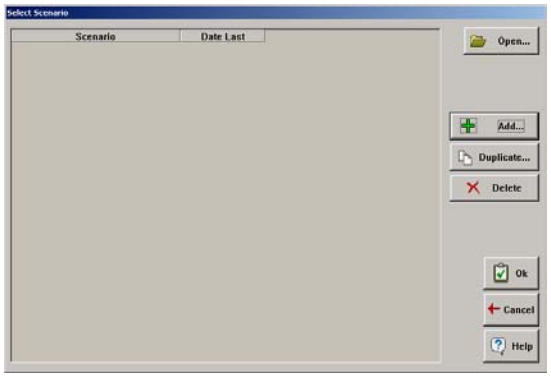
To save either use the "Save" button or select "File/Save" from the menu.

Creating a Scenario

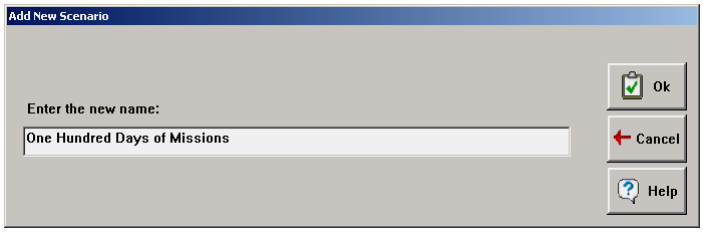
The scenario will define the conditions under which the system you are modeling will be used and the amount of usage the components in each system will incur. You can have multiple scenarios.

Select "Define/Equipment"
Select "Scenarios…".





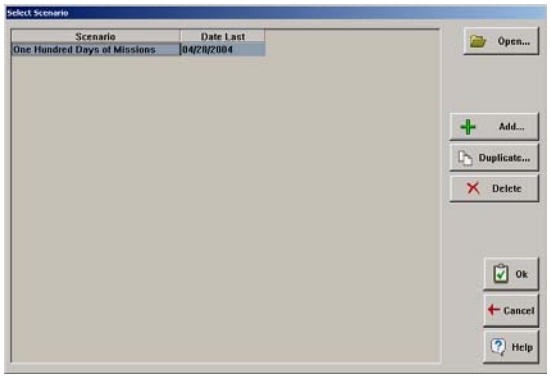
On the Select Scenario screen - select "Add" and enter a Scenario name. Select "OK"



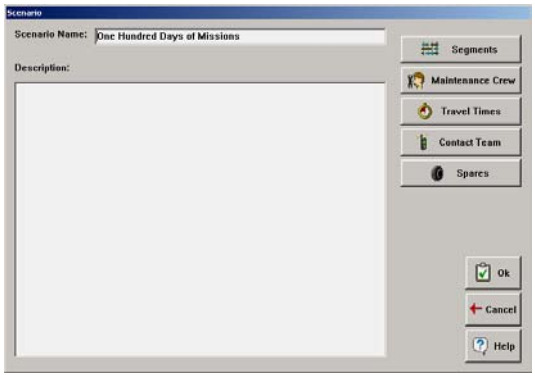
Enter the new name:
One Hundred Days of Missions
Select "OK"

Define Equipment Exercise

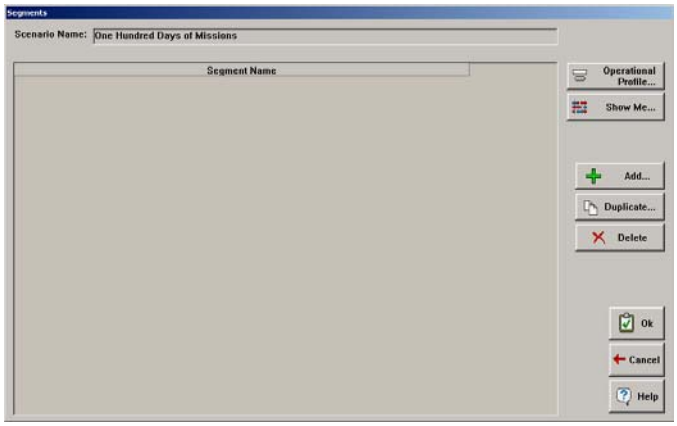
Select “Open”

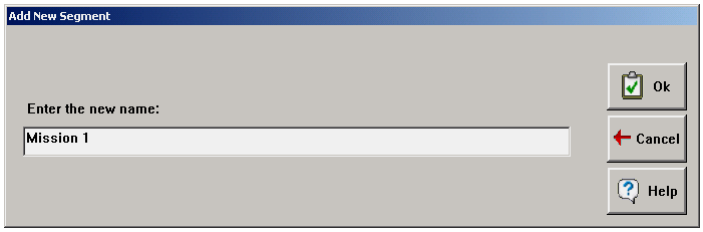


On the Scenario screen - select “Segments”
Scenario segments will determine subsystem usages and probabilities for combat damage. Each scenario can contain multiple segments.



On the Segments screen - select “Add…”

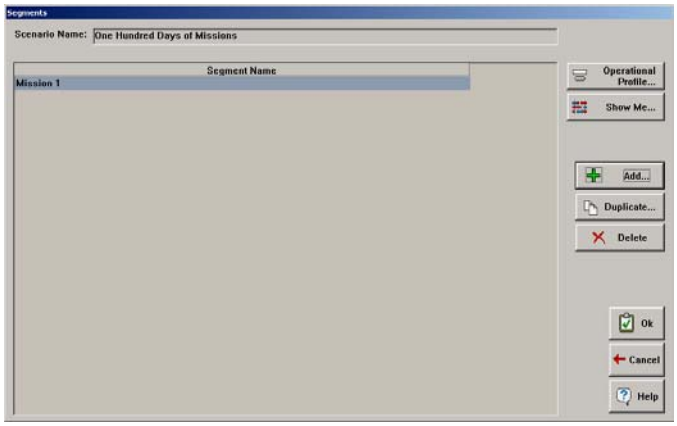




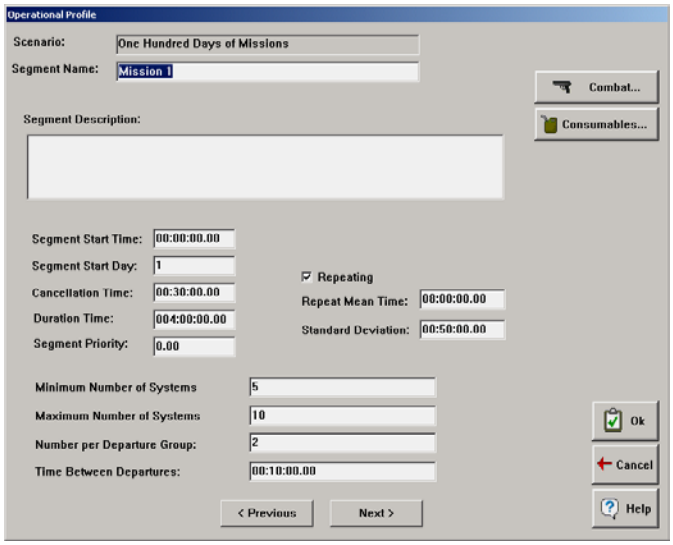
Enter the new name: **Mission 1**
Select “OK”

Define Equipment Exercise

Select "Operational Profile…"



On the Operational Profile screen enter the following-

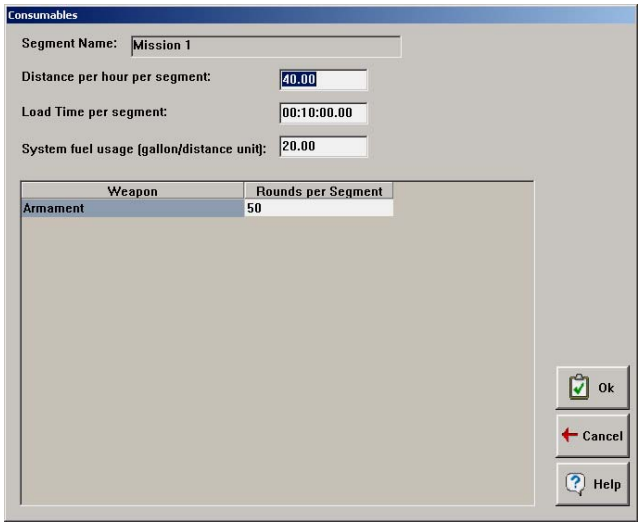


Cancellation Time = **00:30:00.00**
Duration: **= 0004:00:00.00**

Select "Repeating"
Repeat Mean Time = **08:00:00.00**
Standard Deviation = **00:50:00.00**

Min # of System Needed = **5**
Max # of System Needed = **10**
Number per Departure = **2**
Time Between Departures = **00:10:00.00**

Select "Consumables…"

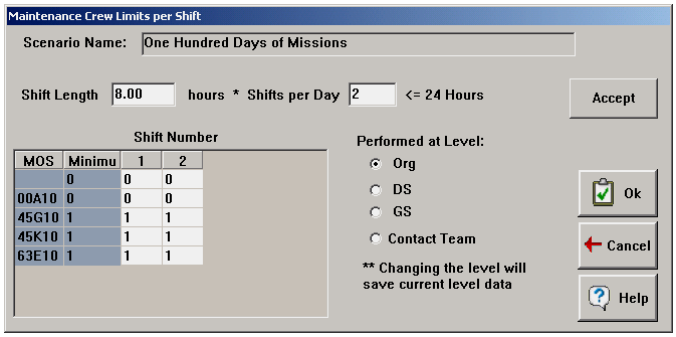


Distance per hour per Segment = **40.00**
Load Time per segment = **00:10:00.00**
System fuel usage (gallon/distance unit) = **20.00**
Armament = **50**

******Note:*** System fuel usage is used to help calculate the Supply and Support requirements that will be covered later in this tutorial

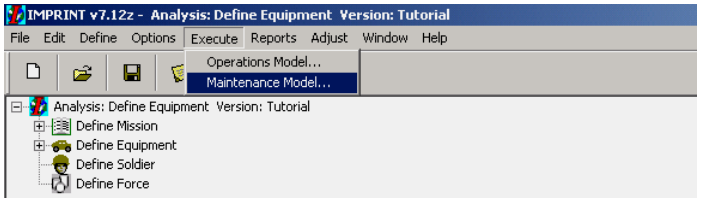
Define Equipment Exercise

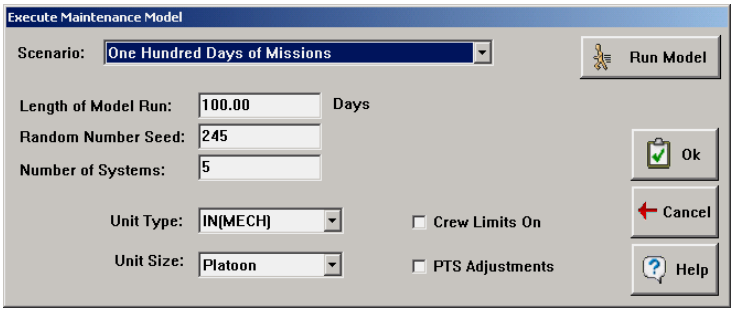
Select "OK" on each screen until you are back to the Scenario screen.
Select "Maintenance Crew".



Shift Length = **8.00**
Shifts per Day = **2**
Select "Accept"
Select "OK"

Keep selecting " OK" until you are back to the Main screen and save your analysis (see "Saving your work" on page 6)and go to "Execute/Maintenance Model".



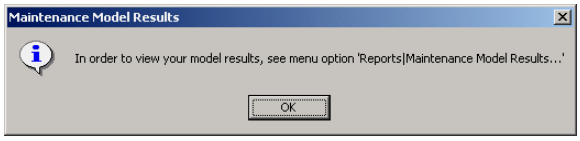


Length of Model Run = **100** Days
Random Number Seed = **245**
Number of Systems = **5**
Unit Type = **IN(MECH)**
Unit Size = **Platoon**

****Note***: The Unit Type and Unit Size are informational only. They do not impact your analysis.

Select "Run Model."

When your model is finished executing, you will get a dialog box informing you that you may view your reports by using the menu option "Reports/Maintenance Results…"

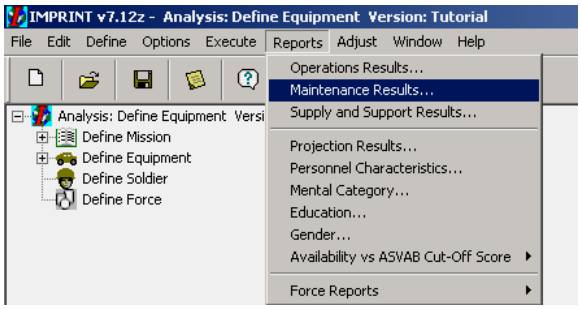


Select "OK" to close the "Maintenance Model Results" pop-up box and then select "OK" to close the Execute Maintenance Model screen.

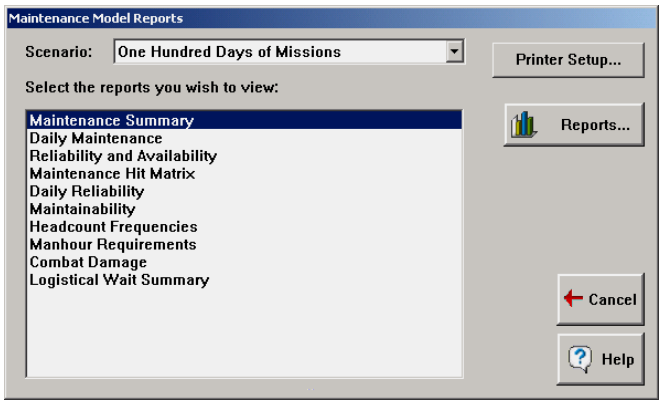
Define Equipment Exercise

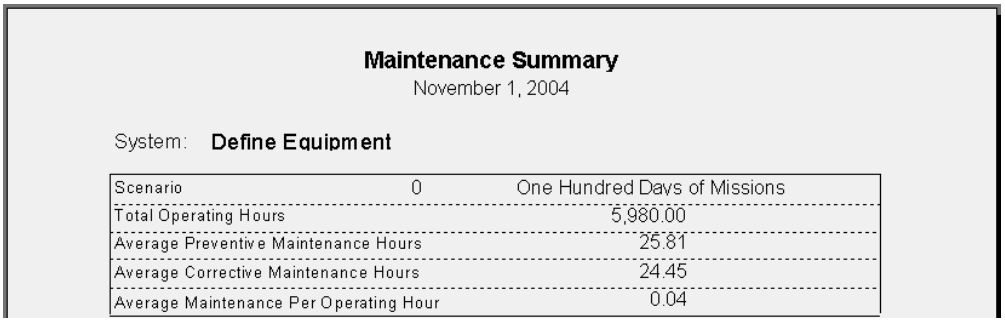
Accessing Reports.

Select "Reports/ Maintenance Model Results…" from the menu.



Select "Maintenance Summary" and then select "Reports"





Maintenance Summary

November 1, 2004

System: **Define Equipment**

Scenario	0	One Hundred Days of Missions
Total Operating Hours		5,980.00
Average Preventive Maintenance Hours		25.81
Average Corrective Maintenance Hours		24.45
Average Maintenance Per Operating Hour		0.04

Define Equipment Exercise

Select "Maintenance Hit Matrix"

Maintenance Hit Matrix

November 1, 2004

System Define Equipment

Scenario 0 One Hundred Days of Missions

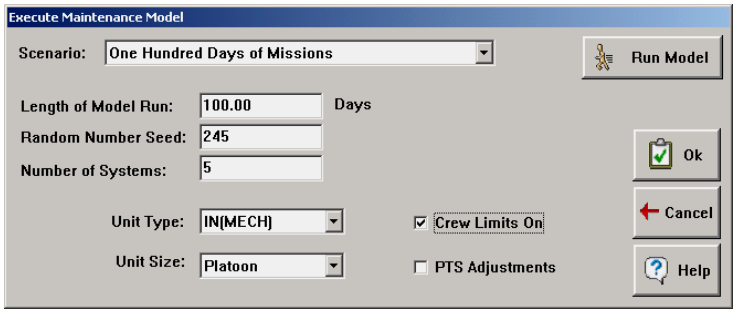
Subsystem Name	Component Name	Task Name	Type of Maint.	Level	MOS 1	No.	MOS 2	No.	Occur.	Man Hours
Armament	Ammo Chute	Remove & Replace	Corrective	Org	45K10	1		0	1,289	42.96
Armament	Ammo Chute	Trouble Shoot	Preventive	DS	63E10	1		0	1,245	41.49
Armament	Barrel Assembly	Adjust & Repair	Preventive	Org	63E10	1		0	714	7.25
Armament	Barrel Assembly	Remove & Replace	Corrective	Org	45K10	1		0	727	7.39
Armament	Ejector Chute	Adjust & Repair	Preventive	DS	45G10	1		0	1,107	27.67
Armament	Ejector Chute	Remove & Replace	Corrective	Org	63E10	1		0	1,090	27.25
Armament	Recoil Mechanism	Adjust & Repair	Corrective	DS	45K10	1		0	20	0.72
Armament	Recoil Mechanism	Remove & Replace	Corrective	Org	45G10	1		0	40	0.54
Communications	AM 1780 VRC	Adjust & Repair	Preventive	DS	63E10	1		0	13	0.48
Communications	AM 1780 VRC	Remove & Replace	Preventive	Org	63E10	1		0	23	0.67
Communications	COMMUNICATIONS	Adjust & Repair	Preventive	Org	63E10	1		0	3	0.06
Communications	COMMUNICATIONS	Inspect	Corrective	Org	45G10	1		0	9	0.18
Communications	Rec/Trans	Adjust & Repair	Corrective	DS	63E10	1		0	6	0.12
Communications	Rec/Trans	Remove & Replace	Preventive	Org	45K10	1		0	9	0.16
Engine	Engine, Other	Inspect	Preventive	Org	63E10	1		0	811	13.51
Engine	Engine, Other	Remove & Replace	Corrective	Org	45K10	1		0	828	35.18
Engine	Fuel Pump	Adjust & Repair	Preventive	DS	63E10	1		0	115	19.93
Engine	Fuel Pump	Inspect	Preventive	DS	45K10	1		0	129	11.82
Engine	Starter	Adjust & Repair	Corrective	DS	45G10	1		0	263	7.89
Engine	Starter	Remove & Replace	Preventive	Org	63E10	1		0	179	5.96

Save reports. (See "Saving Reports" on page 29).

Go back to "Execute/Maintenance Model".
This time select "Crew Limits On"

> ******Note:*** When you select "Crew Limits On", you are telling IMPRINT to use the crew size you designated. When you do NOT select "Crew Limits On", IMPRINT will assume unlimited number of people available to do the work.

Select "Run Model."

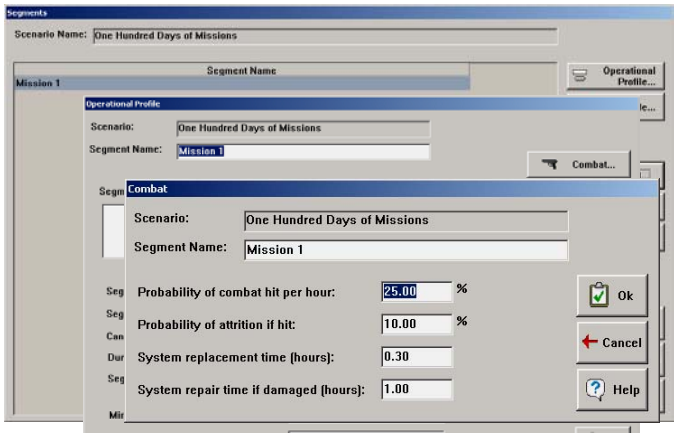


Look at results. Compare to previous results.
Was there any effect?

Go back to the "Define Equipment/Scenarios/Open/Segment/Operational Profile" screen and select "Combat"

Define Equipment Exercise

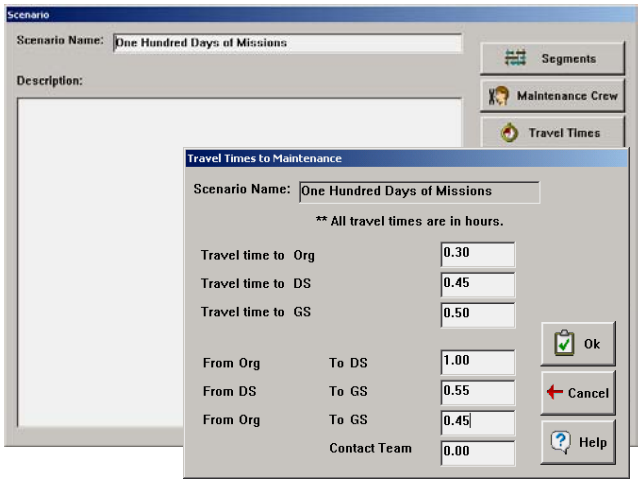
Enter data.



Probability of combat hit per hour = **25.00**
Probability of attrition if hit = **1.00**
System replacement time (hours) = **0.30**
System repair time if damaged = **1.00**

Execute model without crew restraints – (deselect "Crew Limits On")
Look at results.

Go back to "Define/Equipment/Scenario/Open/Travel Times…"

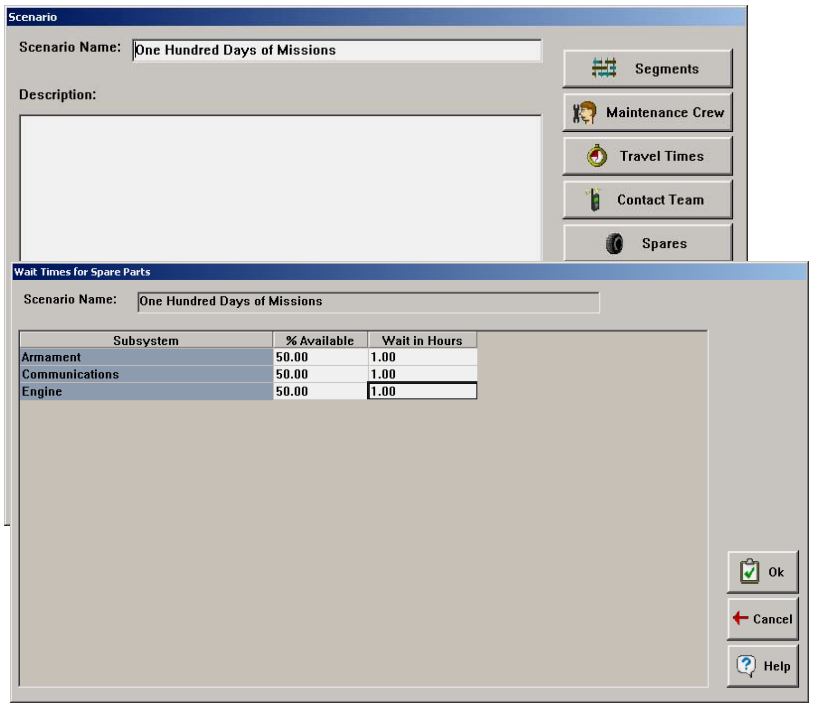


Travel time to Org = **0.30**
Travel time to DS = **0.45**
Travel time to GS = **0.50**
From Org to DS = **1.00**
From DS to GS = **0.55**
From Org to GS = **0.45**

Execute model.
Look at the results.

Define Equipment Exercise

Go back to "Define/Equipment/Scenario/Open/Spares…"



% Available = **50.00**
Wait in Hours = **1.00**

Execute model and look at "Logistical Wait" report.

If you decide to apply stressors and/or performance shaping functions to your maintainers, don't forget to select "PTS Adjustment" when you execute you model. If you do not, there will be no change in your results.

If you check "PTS Adjustments" any applications of personnel characteristics and or stressors will be used to modify Mean Time to Repair (MTTR) data for each task. At this time, there are no reliable data to show how "Training Frequency" affects maintenance. If you do not check "PTS Adjustments", the maintenance model will run with the original (or baseline) MTTR data.

IMPRINT does not require the user to enter Taxons for maintenance task; but IMPRINT does apply taxons based on the type of repair task. (See "Define Equipment Taxons" on page 110.)

Maintenance Model Results Reports

The Maintenance Summary report contains four data items that summarize the maintenance requirements that were generated during the simulation. This report includes the average corrective and preventive maintenance manhours that were simulated for each system. These are calculated by taking the total amount of manhours in each category, and dividing by the total number of systems in the scenario. Also included is the average maintenance manhours simulated per operational hour. This is calculated by dividing the sum of the preventive and corrective maintenance manhours by the total operating hours for all systems.

The Daily Maintenance report contains the amount of maintenance manhours that were simulated at all organizational level types (e.g., ORG, DS, GS) for both maintenance types (e.g., preventive, corrective). This report has scroll bars to scroll up and down, as well as left and right.

The values in this report are totals across all systems.

The Reliability and Availability report has two parts. The first part is the Reliability Summary. It includes the number of segments requested and accomplished during the simulation. The report also includes measures for the number of times systems were requested, and the number of times that those system requests were accomplished. If you had one segment and a maximum of two systems assigned to that segment, then that will be reported as "Number of times Systems Requested" = 2. If only one of the systems actually performed the segment (because the other system was either busy or in maintenance), then that will be reported as "Number of times System Requests Accomplished" = 1.

The second part of the screen includes an Availability Summary. The values are calculated as follows:

Average inherent availability = ((scenario length in hours x # of systems) minus (total clock hours on corrective maintenance)) divided by (scenario length in hours x # of systems)

Average achieved availability = ((scenario length in hours x # of systems) minus (total clock hours on corrective + preventive maintenance)) divided by (scenario length in hours x # of systems)

(Note that inherent & achieved availability consider the total number of days simulated in hours (e.g., 365 * 24), minus the number of clock hours spent in maintenance. Therefore, if 2 or more soldiers are working at the same time on the same system, there are counted just once. Similarly, if two maintenance tasks are being worked at the same time, it is only counted once.)

Readiness = segments accomplished divided by segments requested.

The Maintenance Hit Matrix report is an exhaustive listing of the maintenance tasks that occurred during your simulation.

This report includes maintenance tasks that never occurred. You will identify those actions by noting the zeros in the "Occurrences," or number of occurrences, column. If many of your tasks have not occurred, it indicates that your simulation did not run long enough for the system to require these maintenance tasks (i.e., the mean operational units between failure (MOUBF) for

the tasks is longer than the simulation time period). This probably indicates that you should lengthen the simulation run, and re-execute the model.

Since maintenance tasks are triggered by comparing their MOUBF to a standard exponential curve of accrued usage on each component in the system, there is some randomness associated with simulating when the maintenance task will occur. For this reason, we recommend that you execute the IMPRINT scenario with a variety of random number seeds to ensure that you have generated a representative set of results.

The Daily Reliability report provides a summary of the number of segments and segment requests generated by the simulation for each day of the scenario.

The Maintainability report includes the simulated maintenance manhours per operational hour. This is calculated by dividing the total manhours of maintenance performed on each subsystem by the total number of operational hours of the scenario. Also, the simulated manhours per hour are reported. This measure is calculated by dividing the total manhours of maintenance performed on each subsystem by the total length of the scenario (in hours).

The Headcount Frequencies report contains the percentage of time that different numbers of people were busy for a specific MOS and organizational level type (e.g., ORG, DS, GS). This report is based on the entire length of the simulation, not just the times during the simulation that this MOS was busy or on duty.

This report provides a measure of MOS utilization. It illustrates the frequency with which different numbers of people in each MOS were used. The highest bin for which a > 0% utilization is shown will never exceed the shift manning levels you set for that MOS and that organizational level type. Additionally, if the highest bin shown has a relatively high frequency, as in the example of 20% of the time three people being used, then it is possible that you have constrained this MOS so tightly that it is reducing system availability.

We recommend that you perform the first IMPRINT maintenance model run with the shift manning levels unconstrained. This will result in a simulation that optimizes system availability from the perspective of manpower. Put another way, the simulation will assume that the manpower required to perform any maintenance action will be available. After running the IMPRINT maintenance model in the unconstrained mode, you should examine this Headcount Frequency report for guidance on how to best constrain your shift manning pools (i.e., to minimize the effect on system availability). We recommend that you focus on reducing manpower pools for MOS's that have low utilizations.

The Manhour Requirements report has three columns. They are organizational level, MOS and direct maintenance manhours. This report is useful for identifying the MOS's that are performing the most maintenance.

The Combat Damage report is a brief report that lists the number of combat hits that were simulated for all your systems throughout the entire length of the simulation run. This report also lists the number of simulated attritions, or kills. Finally, the repair time in total number of hours is included. These metrics are stochastically driven as a result of the combat parameters entered earlier in IMPRINT.

Define Equipment Exercise

The combat parameters are mission-specific and include the probability of combat hit per hour, the probability of attrition or repair, and the time it takes to either replace a destroyed system or repair a damaged system.

The Logistical Wait Summary Maintenance report includes two measures. These are the amount of time systems spent waiting for spare parts and the amount of time systems spent waiting for maintainers. Each of these measures are reported by organizational level.

If the amount of time systems spent waiting for spare parts is excessive, you will want to either increase the probability that spares are available or decrease the amount of time required to procure a spare under the "Spares" button in "Define Equipment."

If the amount of time systems spent waiting for maintainers seems excessive, you will either want to increase the number of people in your manpower pools, or you should increase your shift lengths, or you could decrease the operational profile for your systems. Each of these options are available under the "Define Equipment" portion of IMPRINT.

Define Supply Supply

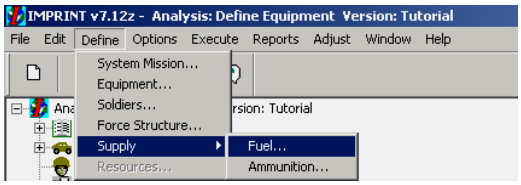
You can enter information on how the necessary fuel and ammunition will be supplied to your systems in each scenario under this IMPRINT option. This information, along with the data entered under Define Equipment, allows IMPRINT to calculate the number of transporters and the associated manpower that will be required to support each scenario.

Fuel

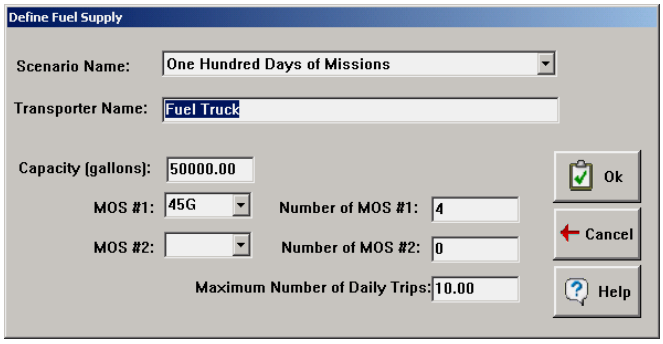
First, you need to select the scenario for which you want to set the fuel supply parameters. For this tutorial we have only one scenario. Then, you need to enter the transporter name, the capacity of that transporter, the manpower required for the transporter, and the maximum number of trips the transporter makes in a single day.

IMPRINT will use this information to calculate the number of transporters and the associated manpower required to supply the necessary fuel. After executing the maintenance model, the supply results will be presented in the "Supply and Support Results".

Select "Define/Supply/Fuel…"from the menu bar.



On the Define Fuel Supply screen enter the following data:



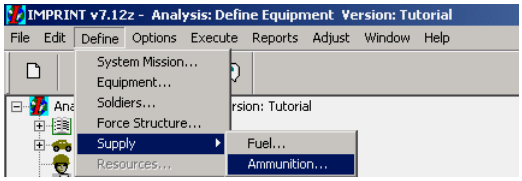
Transporter Name = **Fuel Truck**
Capacity (gallons) = **50000.00**
MOS #1 = **45GE**
Number of MOS #1 = **4**
Minimum Number of Daily Trips = **10.00**

Ammunition

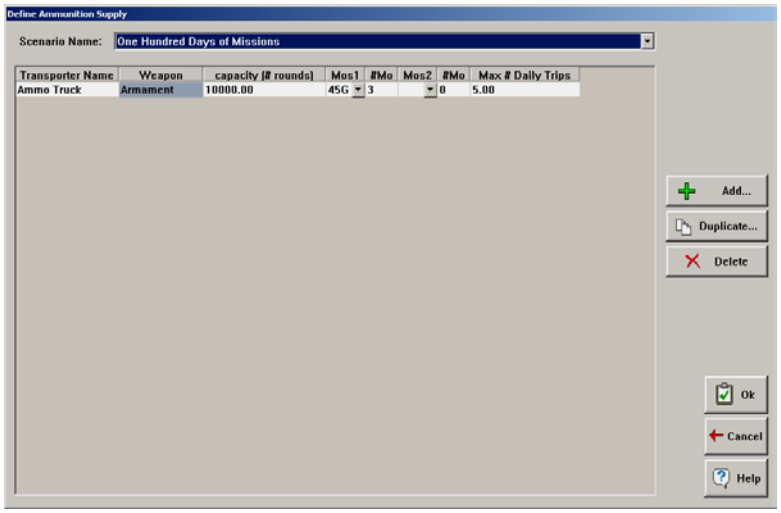
First, you need to select the scenario for which you want to set the ammunition supply. For this tutorial we have only one scenario. Then select a weapon system and fill in the remainder of the data elements. This includes the transporter name, the capacity of the transporter, the manpower required for the transporter, and the maximum number of trips the transporter makes in a single day.

Define Equipment Exercise

Select "Define/Supply/Ammunition…" from the menu bar.



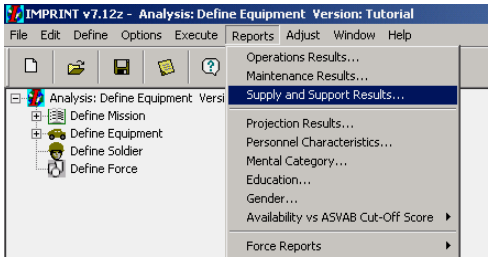
On the Define Ammunition Supply screen enter the following data:



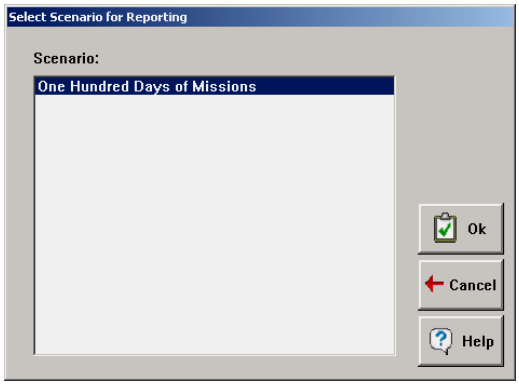
Transporter Name = **Ammo Truck**
Capacity (# rounds) = **10000.00**
MOS 1 = **45G**
#MOS = **3**
Max # of Daily Trips = **3.00**

If you had not executed your maintenance model you would do so now.

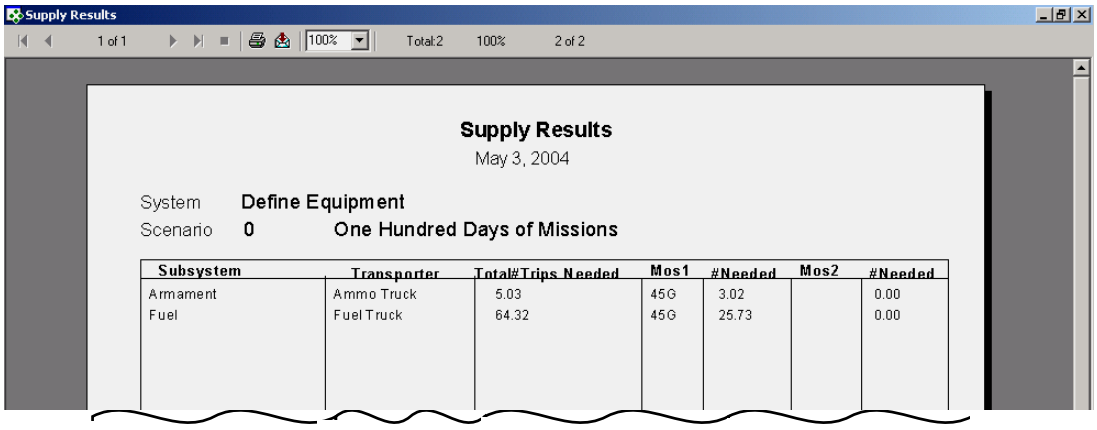
Look at reports. Select "Reports/Supply and Support Results…"



Select the "Scenario". In this case there is only one.



Define Equipment Exercise



This report contains the fuel and ammunition requirements needed in order to support a mission. These support requirements are based on the daily fuel and ammunition requirements for a particular scenario entered under "Define Equipment" and the capacity and manpower available per transporter entered under "Define Supply". The columns of the report are:

- Subsystem name
- Transporter name
- Total number of trips needed
- First MOS that was assigned to transport the fuel
- Number of the transporters of the first MOS that must work together to perform the task
- Second MOS that was assigned to transport the fuel
- Number of the transporters of the second MOS that must work together to perform the task.

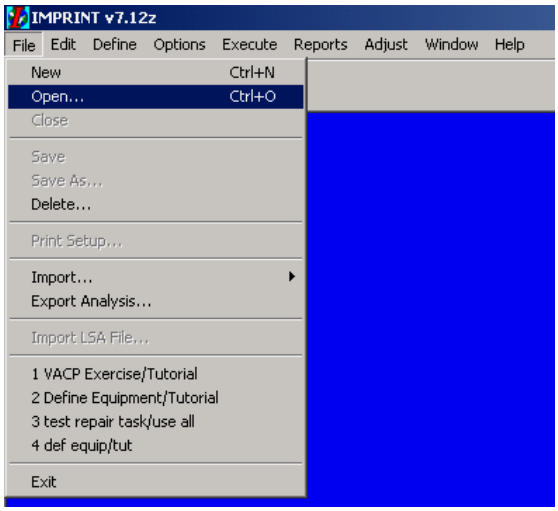
Workload Exercise

Overall Workload

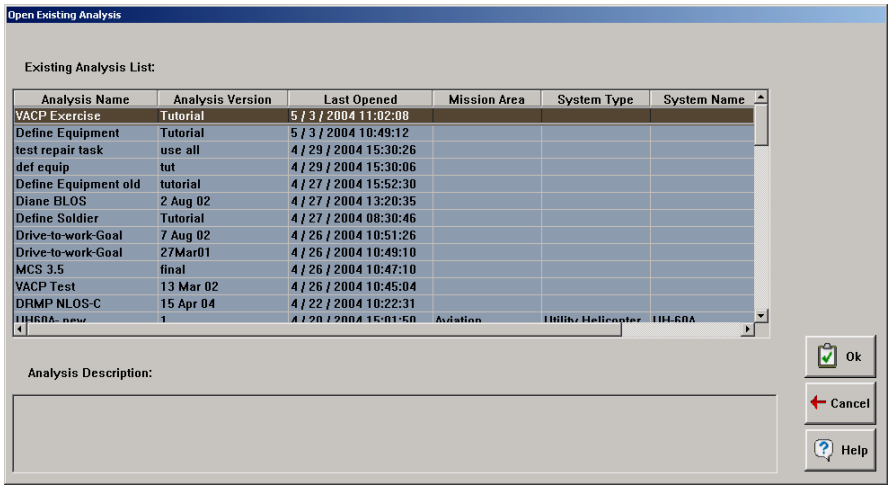
For more information on "Overall Workload" see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

Use the analysis you created in the "Define System Mission Exercise" section.

Start IMPRINT. "Select File/Open…"

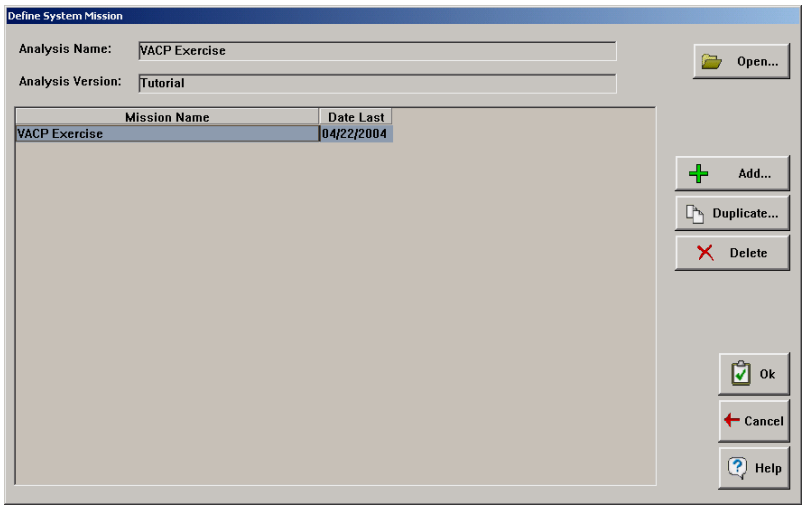


From the Open Existing Analysis screen, highlight "VACP-Exercise" (as shown below) and select "OK".

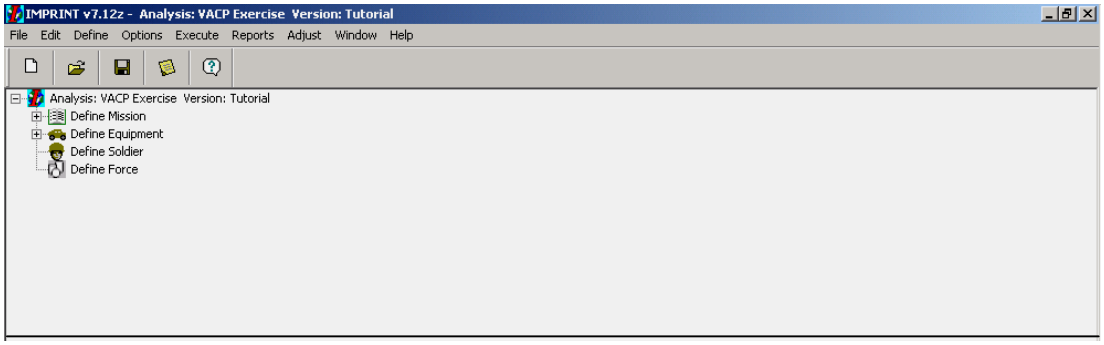


Workload Exercise

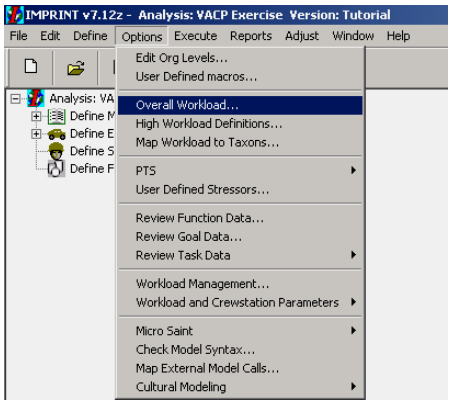
Open your mission by selecting "Define/System Mission….." from the menu bar
OR - you can select "Define Mission" from the hierarchical tree on the Main screen
Select "Open" on the Define System Mission screen.



When you get to the Mission Information screen, select "OK".
Select OK until you are back to the Main screen.



Select "Options\Overall Workload..."



This option allows you to define an overall workload measure for VACP Missions. In essence, it is used to combine the four workload channels into a single combined channel.

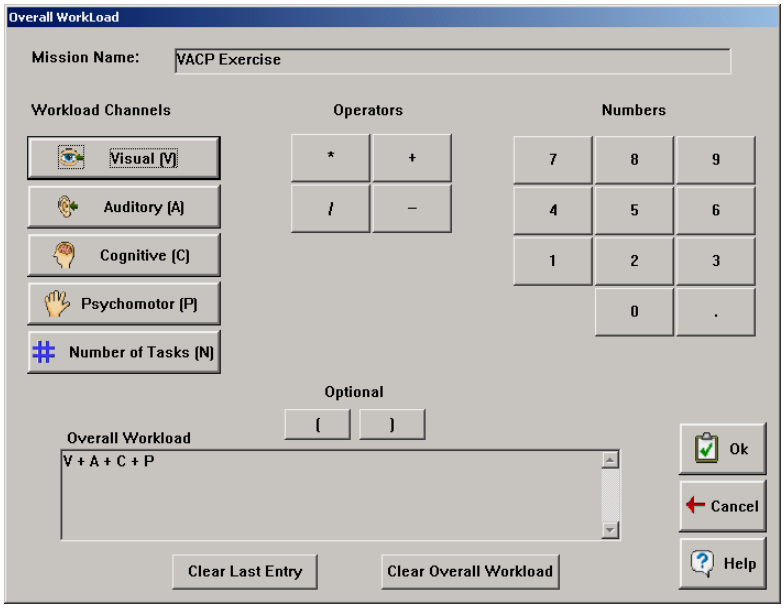
Workload Exercise

For this exercise we are adding all four channels. To do this

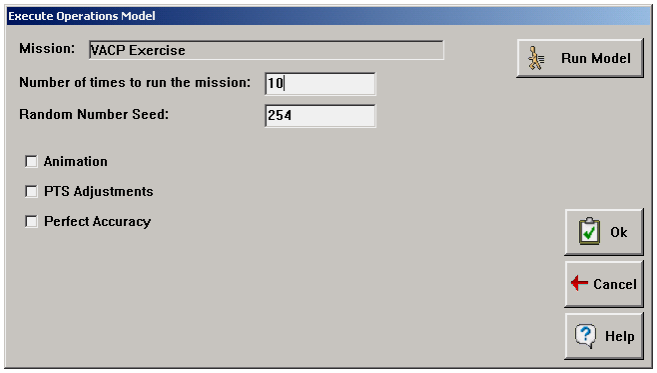
Select "Visual (V)" then select "+" under Operators
Select "Auditory (A)" then select "+" under Operators
Select "Cognitive (C)" then select "+" under Operators
Select "Psychomotor (P) then select "+" under Operators

When you are finished your "Overall Workload" field should look the same as the screen below.

Select "OK"



Go to "Execute/Operations Model"

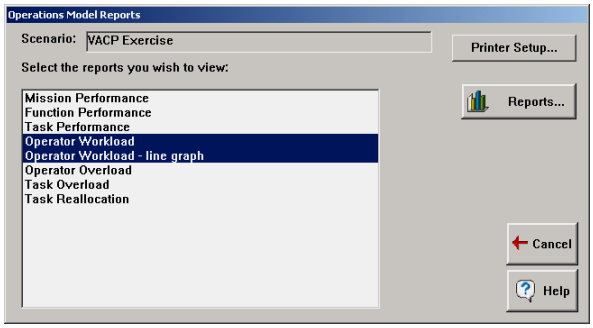


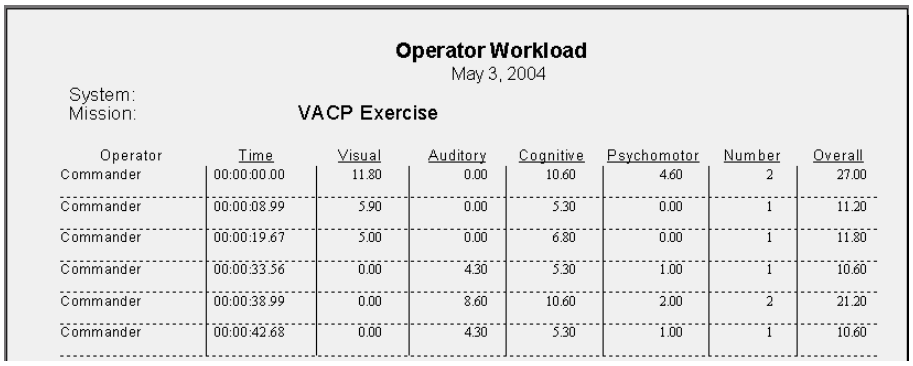
Number of time to run the mission = **10**
Random Number Seed = **254**

Select "Run Model"

When finished, select "OK" and then select "Reports/Operations Model Results…" Select the "Operator Workload" report and the "Operator Workload – line graph" report.

Workload Exercise



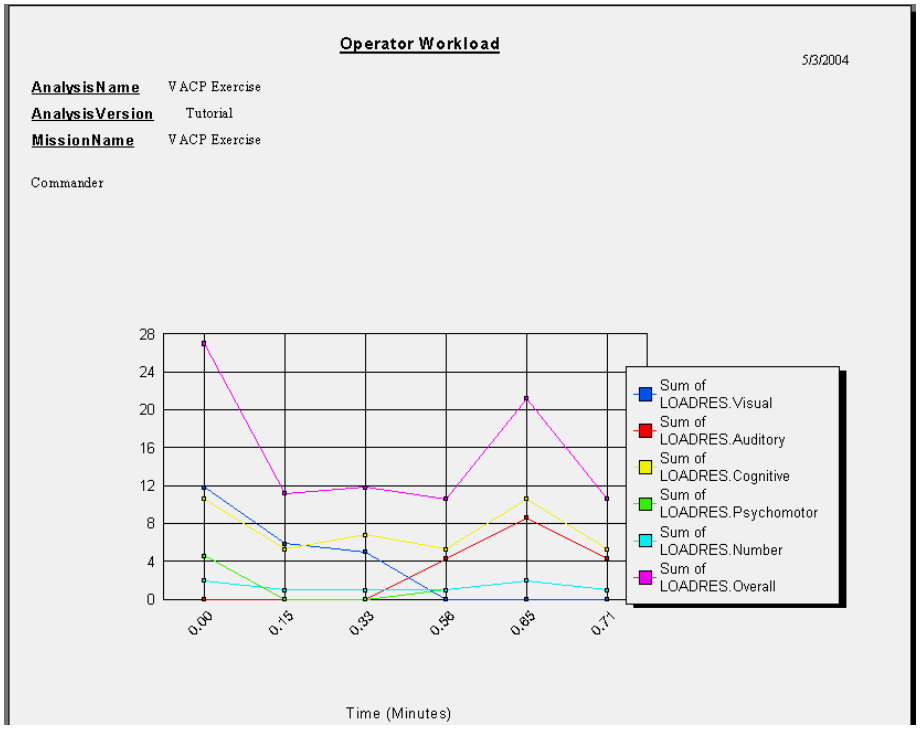


Operator Workload

May 3, 2004

System:
Mission: VACP Exercise

Operator	Time	Visual	Auditory	Cognitive	Psychomotor	Number	Overall
Commander	00:00:00.00	11.80	0.00	10.60	4.60	2	27.00
Commander	00:00:08.99	5.90	0.00	5.30	0.00	1	11.20
Commander	00:00:19.67	5.00	0.00	6.80	0.00	1	11.80
Commander	00:00:33.56	0.00	4.30	5.30	1.00	1	10.60
Commander	00:00:38.99	0.00	8.60	10.60	2.00	2	21.20
Commander	00:00:42.68	0.00	4.30	5.30	1.00	1	10.60

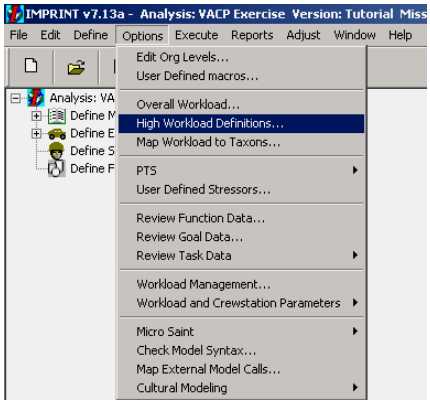


Now go back and execute your mission **1** time. Look at the report again. It should have the same results. IMPRINT only looks at the first run for workload.

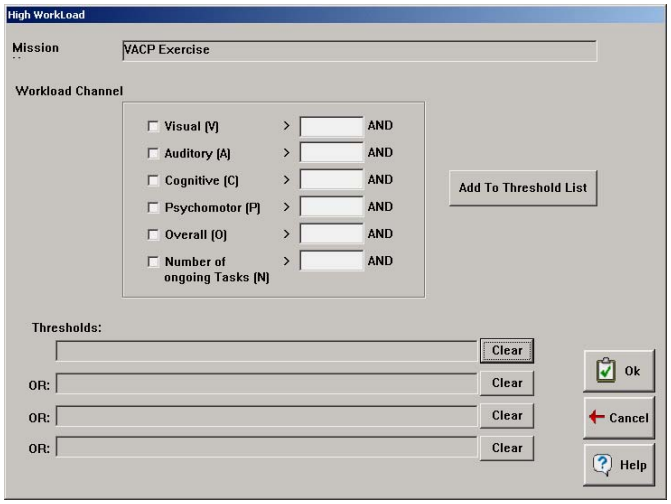
High Workload Definitions

For more information on "High Workload Definitions" see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your "imprint7" folder.

Select "Options/High Workload Definitions…" from the menu bar.

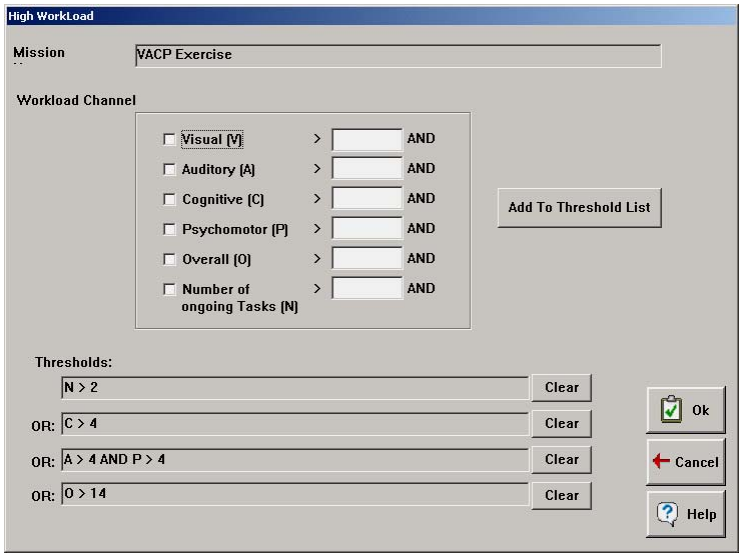


This option is used to identify high workload levels for crewmembers. When your IMPRINT system mission model runs, the current workload levels of each operator are added across all tasks that the operator is performing. The sum is compared to each of the high workload definitions. If the current workload meets or exceeds any of the definitions, that segment of the mission is marked as "high workload".



For this exercise we want to see when the "Number of ongoing tasks" is greater than 2 or when "Cognitive" is greater than 4 or when "Auditory" and "Psychomoter" is greater than 4 or when "Overall" (the overall workload which has already been defined (V+A+C+P)) is greater than 14.

Workload Exercise



Select "Number of ongoing tasks (N)" and enter **2** - select "Add to Threshold List"

Select "Cognitive (C)" and enter **4** - select "Add to Threshold List"

Select "Auditory (A)" enter **4** and select "Psychomoter (P)" enter **4** - select "Add to Threshold List"

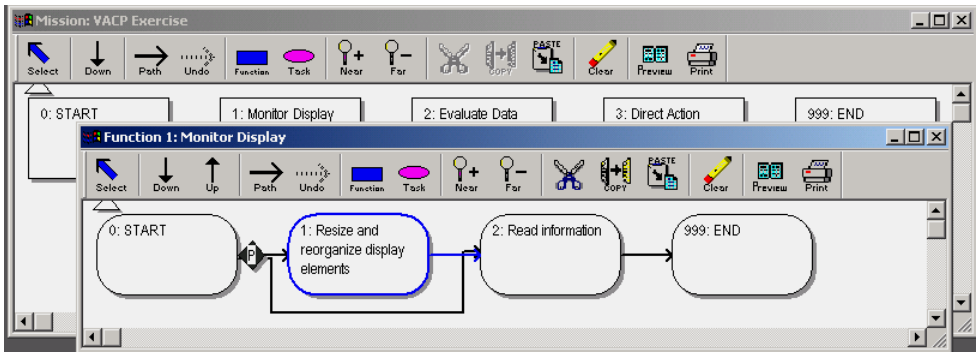
Select "Overall (O)" enter **14** - select "Add to Threshold List"

When finished your screen should look like the above screen. If you make an error and you have already added to threshold list, select "Clear".
Select "OK". Now you are back to the Main screen.

Before we execute the model and look to see if our crewmember is in high workload we need to assign a secondary crewmember to each of our tasks. We do this so that if we decide to reassign some tasks to another crewmember after we analyze our reports we can use the "Workload Overload Reassignment" option under "Adjust" on the main menu bar.

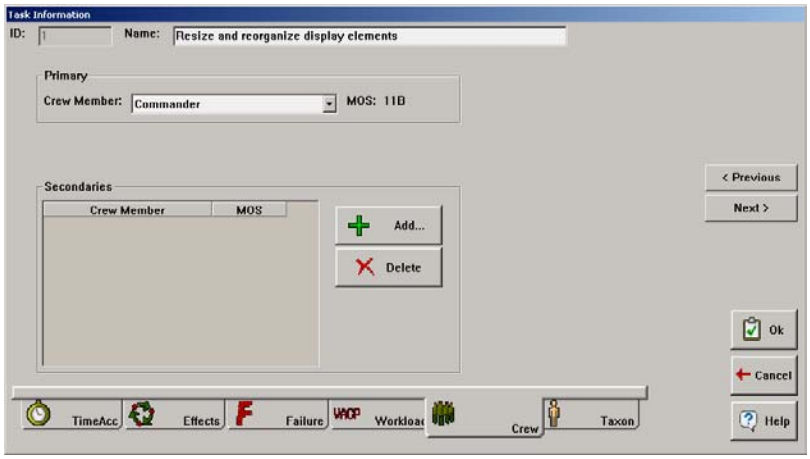
Select "Define/System Mission….." from the menu bar
OR - you can select "Define Mission" from the hierarchical tree on the Main screen
Select "Open" on the Define System Mission screen.
Select "Function + Tasks" from the Mission Information screen.
Select "Network Diagram" from the Function and Task List screen

Using the "Down"  tool go down into the first function, ""Monitor Display"

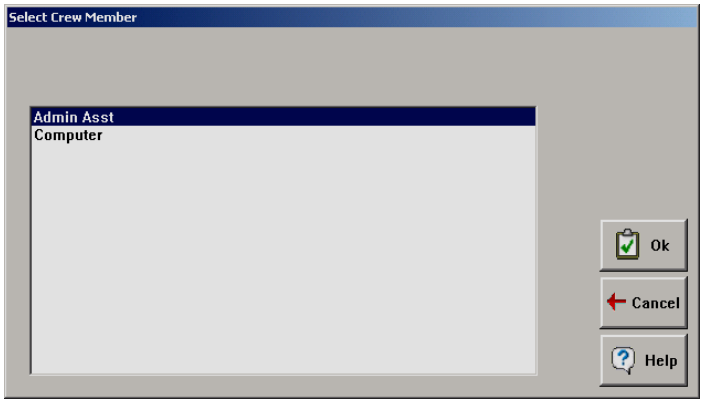


Double click on "Resize and reorganize display elements" and select the "Crew" tab

Workload Exercise

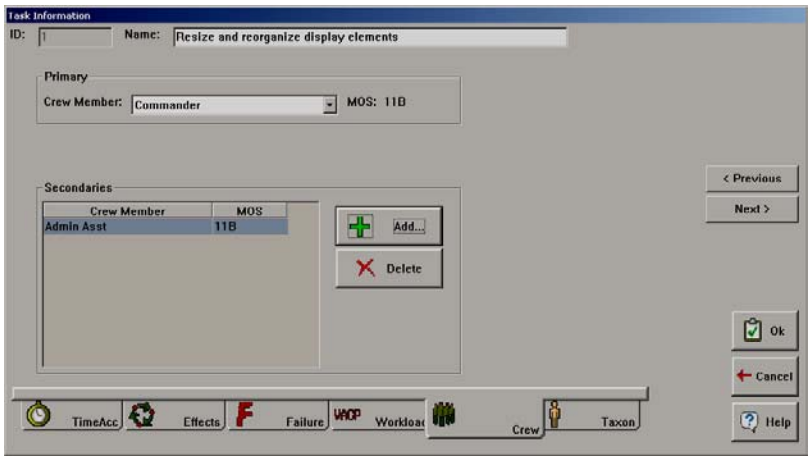


Select "Add…" to assign a secondary crewmember.



Select – **Admin Asst**
Select "OK"

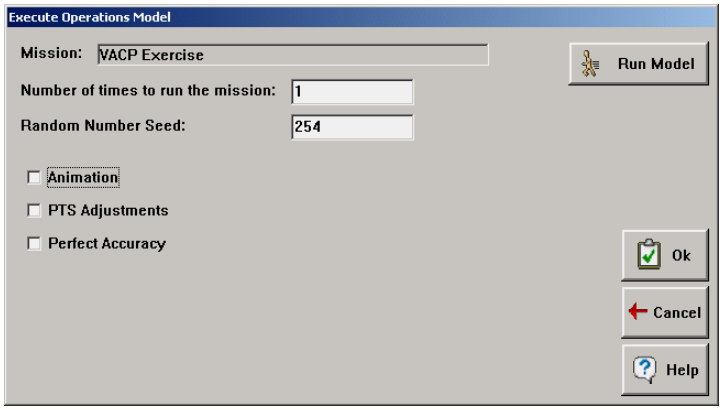
You will now see a crewmember listed.



Go to the next task and do the same. When finished with the function "Monitor Display" select the "Up"  tool and go back to the function level and go down into the next function and assign the same secondary crewmember to the task(s) in that function. Do this until you have assigned a secondary crewmember to each tasks in the network. When finished save your analysis.

Workload Exercise

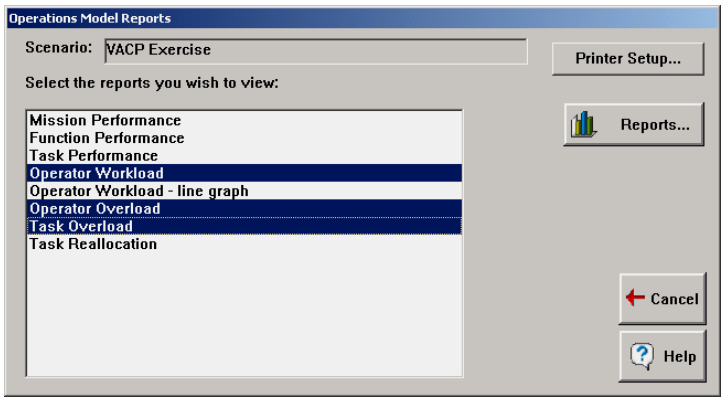
Go to “Execute/Operations Model”

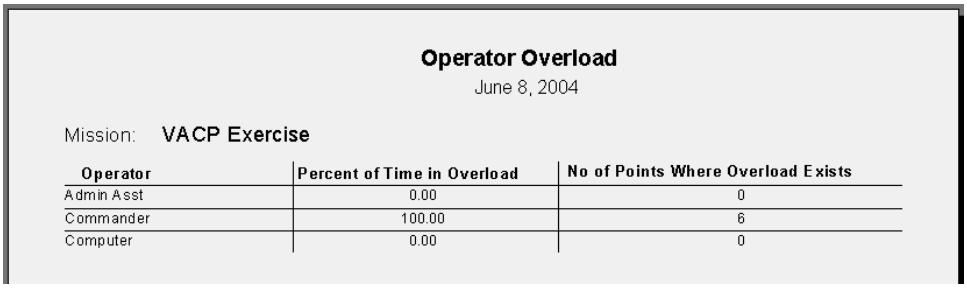


Number of time to run the mission = **1**
Random Number Seed = **254**

Select “Run Model”.

When finished, select “OK” and then select “Reports/Operations Model Results…” Select the “Operator Workload”, “Operator Overload” and the “Task Overload” reports.



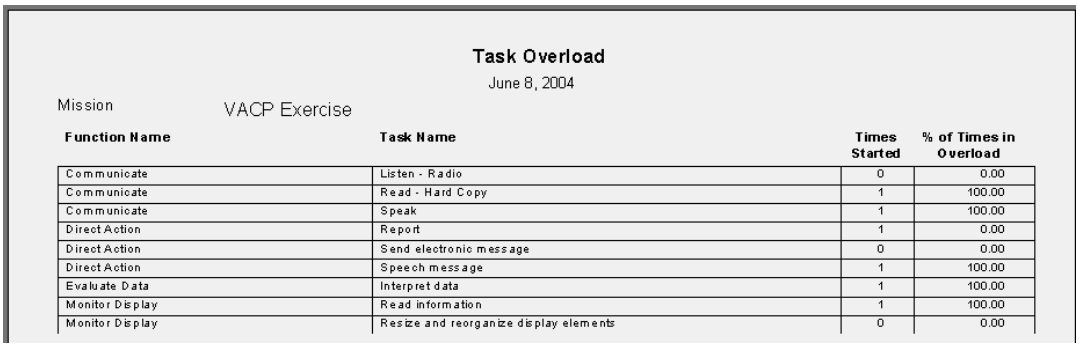


Operator Overload

June 8, 2004

Mission: **VACP Exercise**

Operator	Percent of Time in Overload	No of Points Where Overload Exists
Admin Asst	0.00	0
Commander	100.00	6
Computer	0.00	0



Task Overload

June 8, 2004

Mission VACP Exercise

Function Name	Task Name	Times Started	% of Times in Overload
Communicate	Listen - Radio	0	0.00
Communicate	Read - Hard Copy	1	100.00
Communicate	Speak	1	100.00
Direct Action	Report	1	0.00
Direct Action	Send electronic message	0	0.00
Direct Action	Speech message	1	100.00
Evaluate Data	Interpret data	1	100.00
Monitor Display	Read information	1	100.00
Monitor Display	Resize and reorganize display elements	0	0.00

Workload Exercise

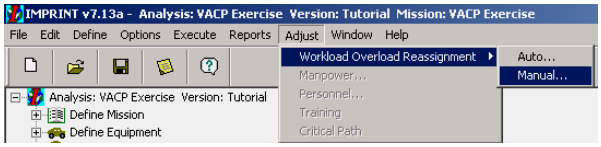
Operator Workload
June 8, 2004

System:
Mission: VACP Exercise

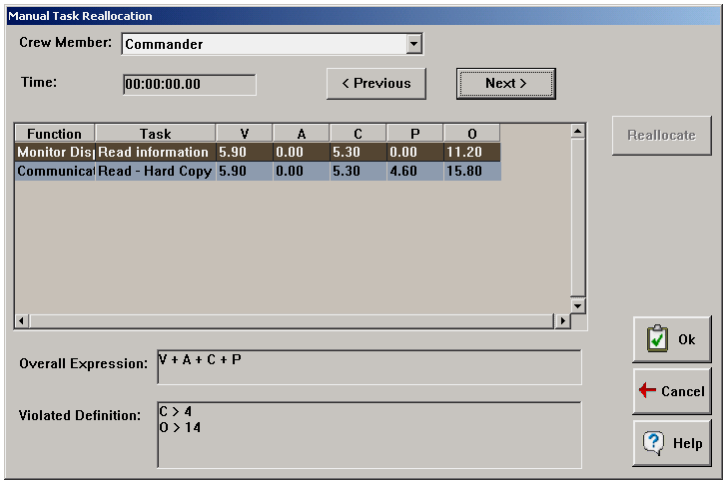
Operator	Time	Visual	Auditory	Cognitive	Psychomotor	Number	Overall
Commander	00:00:00.00	11.80	0.00	10.60	4.60	2	27.00
Commander	00:00:08.99	5.90	0.00	5.30	0.00	1	11.20
Commander	00:00:19.67	5.00	0.00	6.80	0.00	1	11.80
Commander	00:00:33.56	0.00	4.30	5.30	1.00	1	10.60
Commander	00:00:38.99	0.00	8.60	10.60	2.00	2	21.20
Commander	00:00:42.68	0.00	4.30	5.30	1.00	1	10.60

Based on the high workload definitions we established we can see from the "Operator Workload" report that the "Commander" is in high workload during the whole mission.

If you decide you want to reassign one or more tasks to the secondary crewmember you would select "Adjust/Workload Overload Reassignment/Manual…" You could select "../Auto…" but for this exercise we will select "../Manual…"



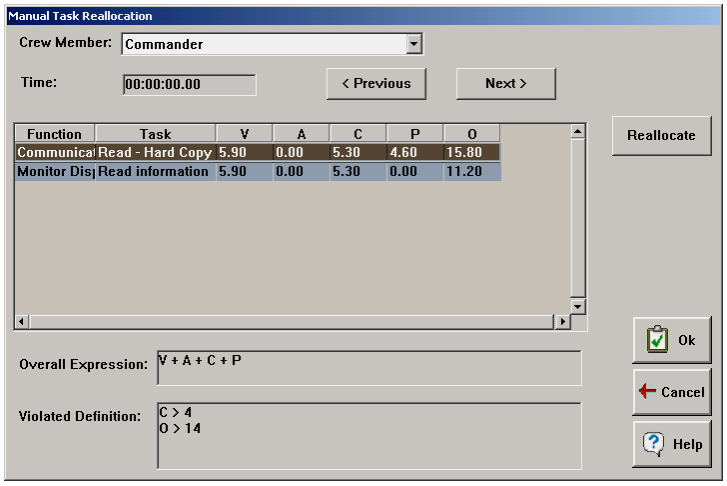
When you do you will see the Manual Task Reallocation screen.



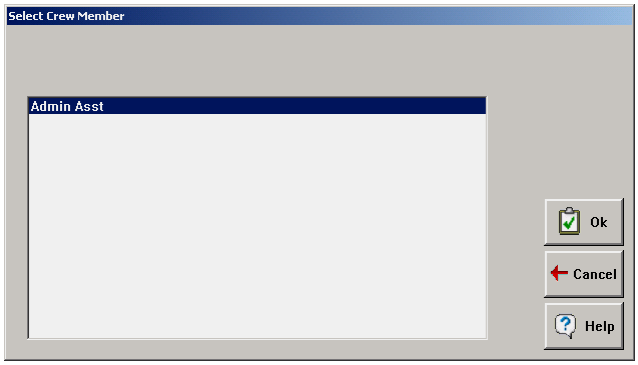
If you compare this to the "Operator Workload" report you will see that at time "00:00:00.00" the "Commander" was performing 2 tasks and you will see the workload channel values for these tasks. If you add the two Visual (V) channels for each task, it will be equal to 11.80 which is what is reported on report. The Overall (O) adds up to 27.00 which is what is reported on the "Operator Workload" report.

Workload Exercise

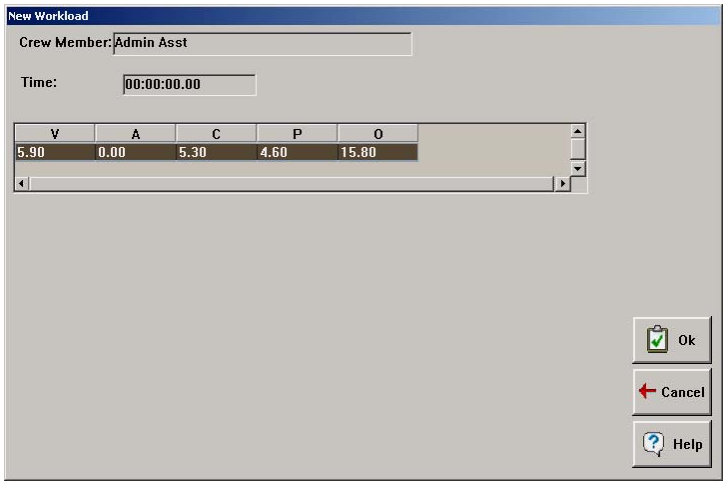
To reassign a task to the secondary crewmember select the task you want to reassign, in this case "Read – Hard Copy" – then select "Reallocate"



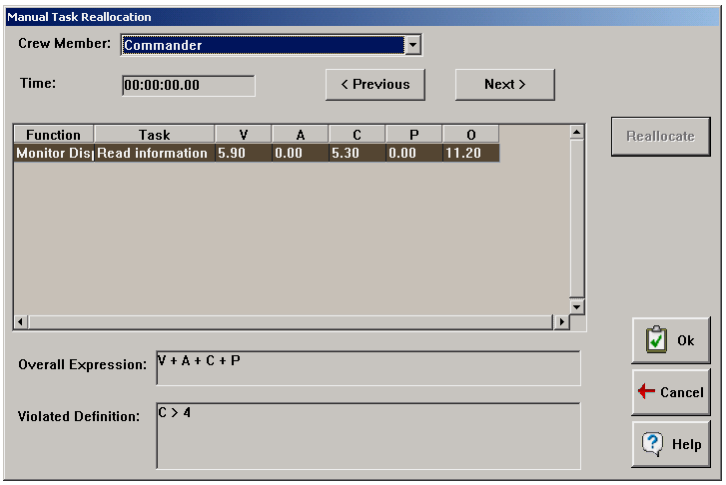
Select the crewmember, in this case there is only one, and then select "OK"



You will see the New Workload screen.

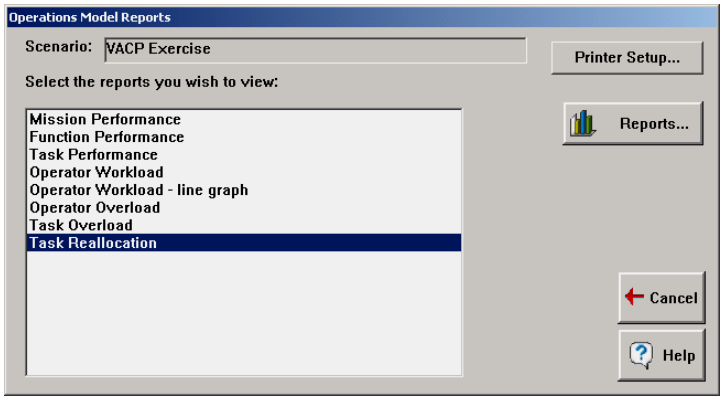


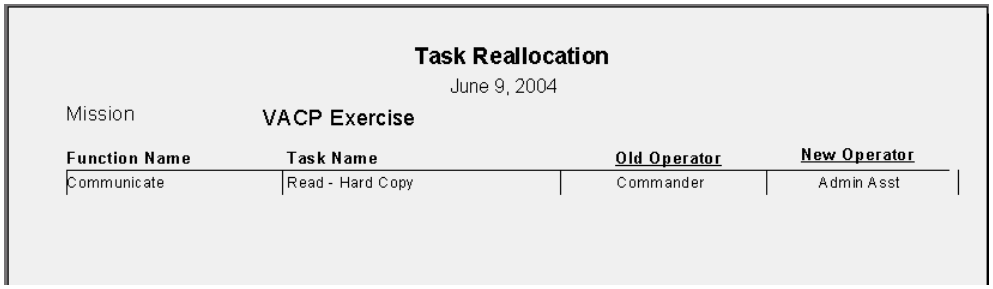
Select "OK" and you will see the next screen.



Now you see that only one task is assigned to the "Commander" at time "00:00:0.00". If you select next you will see other tasks at other times that are considered in overload (remember you defined what considered overload for this crewmember on this mission) and they will match the times and data in the "Operator Workload" report. For this exercise we will only reassign one task. Select "OK".

Now select "Reports/Operations Results…" Select "Task Reallocation"





Task Reallocation

June 9, 2004

Mission VACP Exercise

Function Name	Task Name	Old Operator	New Operator
Communicate	Read - Hard Copy	Commander	Admin Asst

You will see that the report list the "New Operator" as the "Admin Asst". This report will be blank after you re-run the model.

To see if the this made any difference, run the model again and review the workload reports.

Sharing Your Analysis

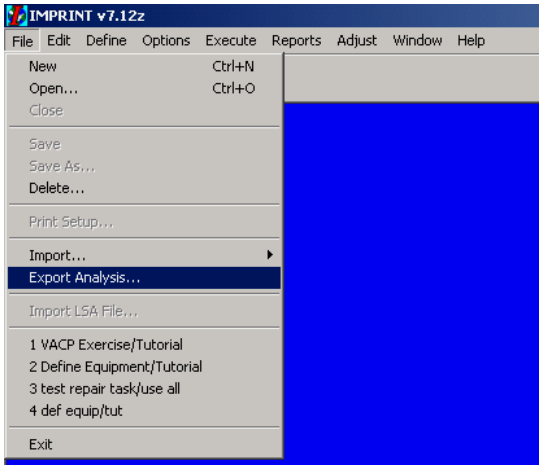
IMPRINT allows you to share your analysis with others and vice-versa. When an analysis is imported/exported, the analysis and all its data are made available to another user. You can also export an analysis for archiving purposes.

You can import an analysis that was created in an older version of IMPRINT. Importing the analysis will automatically translate it into a format that is compatible with your version.

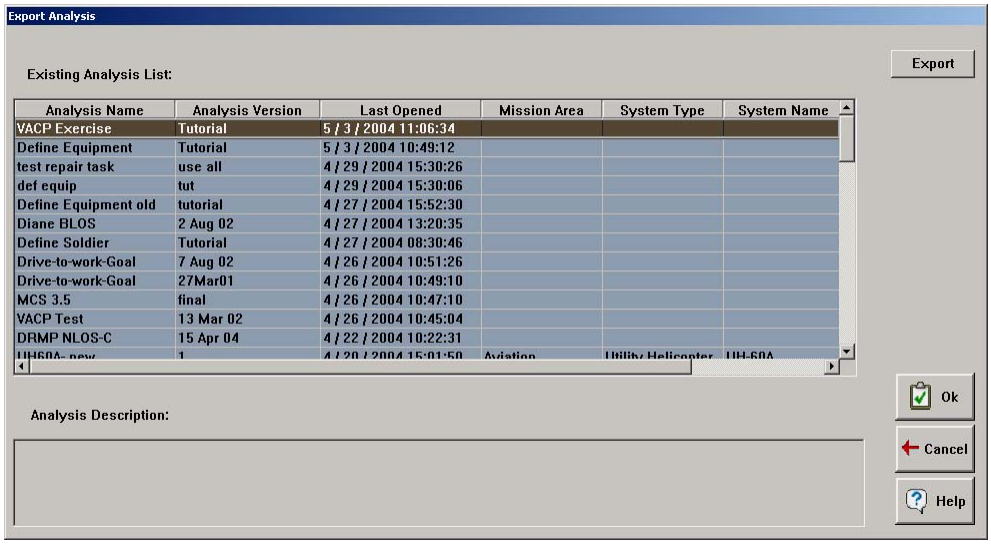
Both the import or export commands are available only when no analysis is open.

Exporting

To export an analysis select "File/Export Analysis…" from the menu.

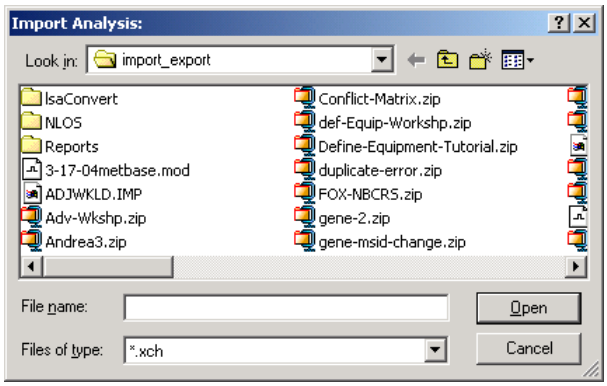


You will then see Export Analysis screen. This screen lists all of your analyses.

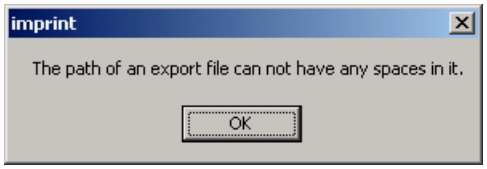


Select the analysis you want to export and then select "Export".

You will then see the Export to: screen and will be prompted for a filename. Notice that the extension an exported file in IMPRINT is ".xch"

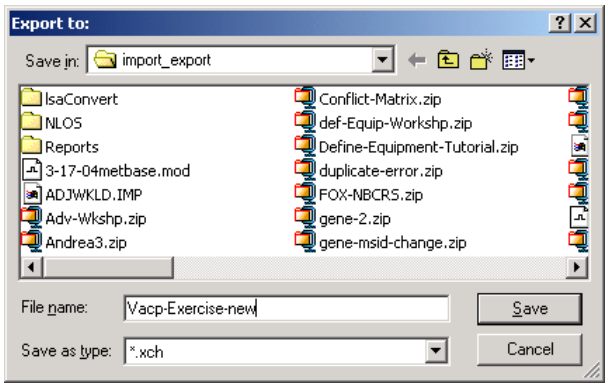


Select the name you want to give the export file. The default folder is the "import_export" folder created at the time IMPRINT is installed. You can select a different folder/drive, however if you do, remember you cannot export a version 7 analysis to a folder with a name containing spaces. When you name the file, the file name cannot contain spaces. If either the folder or file name contains spaces you will get the following message -



and then returned to the Export Analysis screen.

If you selected the default folder or a valid folder, enter a valid file name. Do not use spaces in your file name. If you do use spaces in your file name you will get the same message as shown above and be returned to the Export Analysis screen.

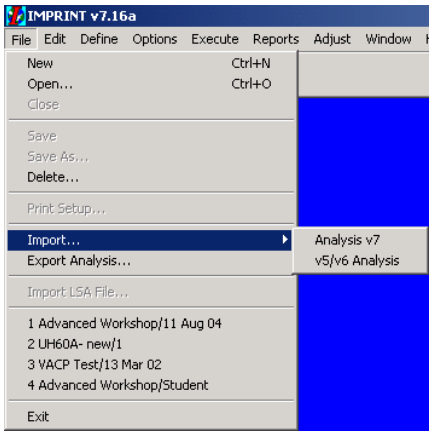


File name: = **VACP-Exercise-new**
Select "Save"

Sharing Your Analysis

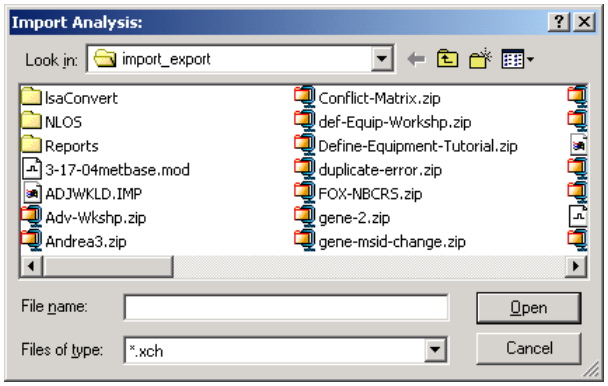
Importing

To import an analysis select "File/Import…" from the menu.



Version 7 Import

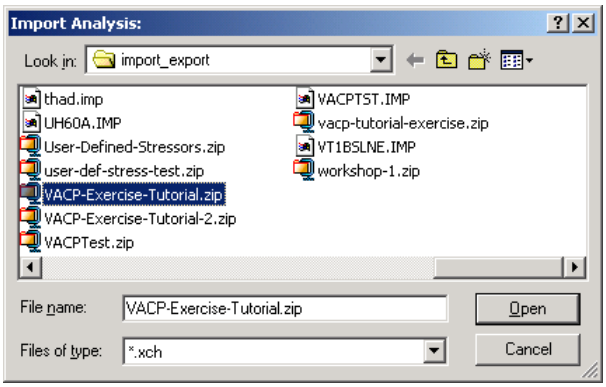
If are importing a version 7 analysis then you must select "Import/Analysis v7". When you do, you will see the following Import Analysis: screen. The default folder is the "import_export" folder created at the time IMPRINT is installed. You can select a different folder/drive, however if you do remember you cannot import a version 7 analysis from a folder with a name containing spaces. Notice that the "Files of type:" specifies "*.xch". However, because previous versions of 7 used ".zip" you are able to import an analysis that was exported from a previous version of IMPRINT 7.



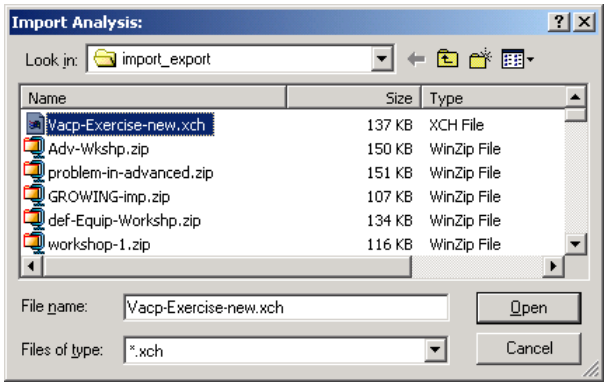
Sharing Your Analysis

Select the analysis you want to import

If you are importing an analysis that was exported in an older version of IMPRINT 7 then select the analysis you want to import, in this case "VACP-Exercise-Tutorial.zip"



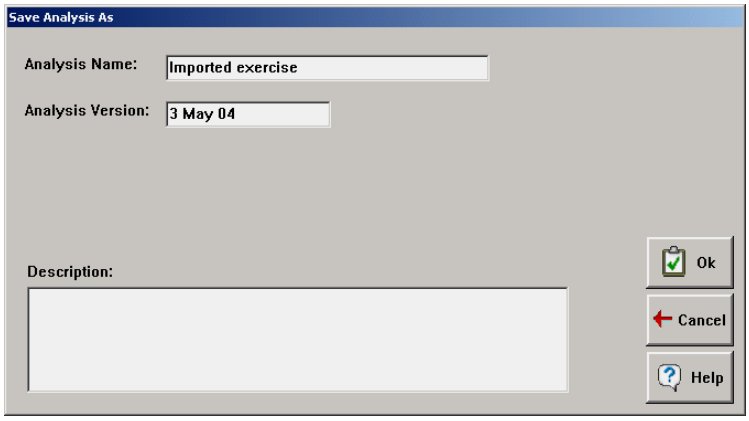
If you are importing an analysis that you exported in the newer versions then select the analysis you want to import, in this case "Vacp-Exercise-new.xch".



Select "Open" (This and the following information applies whether you are importing an analysis with the ".xch" or ".zip" extension.)

You will get a message asking you to "Please Wait" while the analysis is being imported. If the analysis already exist and you will get the following message:

Select "OK". You then see the following:



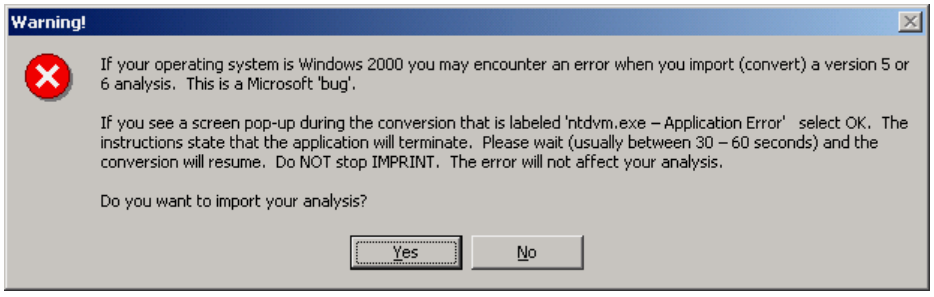
If you want save the new import then give it a different analysis name and/or version. If you decide you don't want the analysis then select "Cancel".

This does not open the analysis. You must select "File/Open" on the menu bar or use the "Open" button.

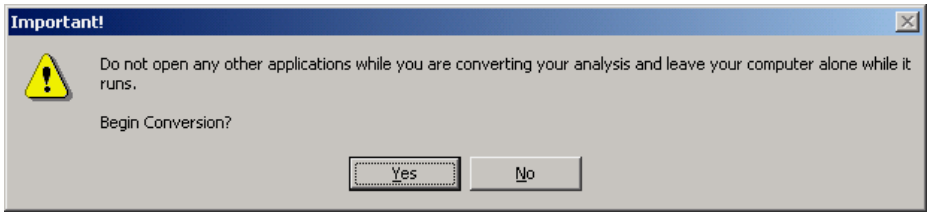
Version 5/6 Import

If you are a new IMPRINT user and do not have any old analyses you will not be able to do the following the section of this tutorial. However, keep it in mind if someone sends you a version 5 or version 6 analysis.

If you want to import an analysis from a previous IMPRINT version, (version 5 or version 6) then select "Import/ v5/v6 Analysis" When you do you will see the following screen:

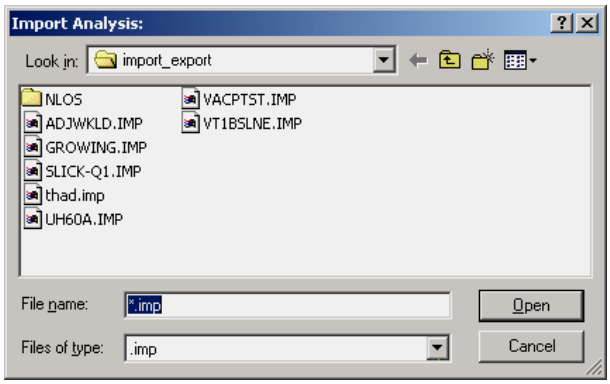


As the message states you may encounter an error when you import a version 5 or version 6 analysis. Please follow the instructions on this Warning! screen. If you decide you don't want to import the analysis, select "No". To continue select "Yes".
When you select "Yes" you will see the next screen:

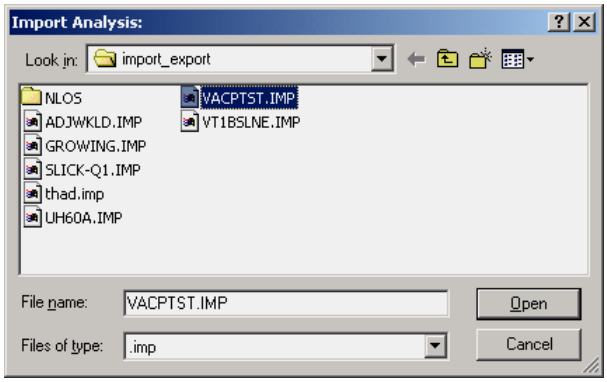


Sharing Your Analysis

If you decide not import the analysis select “No”. To begin the conversion select “Yes”. You will then see the Import Analysis screen.



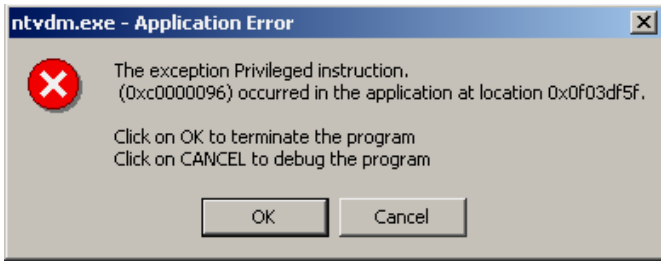
In this example we are selecting “VACPTST.IMP”. You will have different files. Select one of your analyses.



After you select the file select “Open”. IMPRINT will begin the conversion process. During this process do NOT use your computer.

Sharing Your Analysis

Windows 2000 Users: You may encounter an error when you use IMPRINT for the first time during the conversion process of your version 5 or 6 analyses. **This is a Microsoft "bug"**. If you see the following pop-up screen, select "OK". Although the message states that this action will terminate the program, **wait.** Do **NOT** stop IMPRINT. Within 30 – 90 seconds (depending on the system) the conversion will resume. This error will NOT affect the conversion process

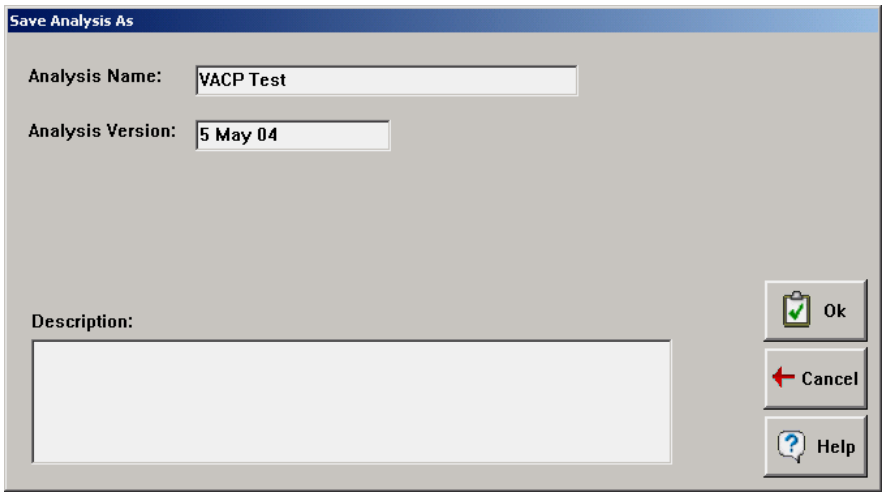


During the last step in the conversion process you will see a DBUNLOAD screen similar to this one:

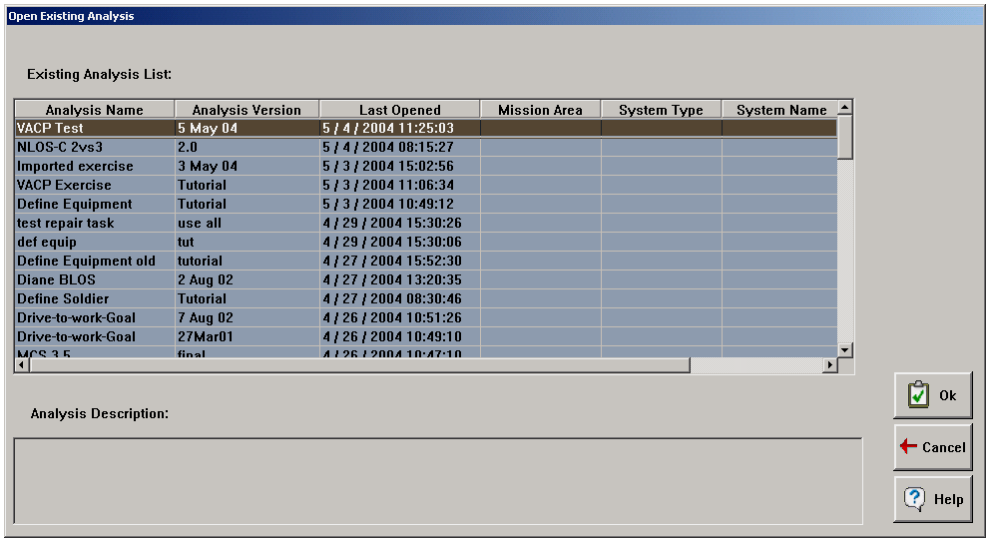
Sharing Your Analysis

Once this step is complete you will either get the blank screen or if you have an analysis with the same name you will be asked for a new name and/or version.

If the analysis already exist, select "OK" and when you get the Save Analysis As screen, enter a new name and/or a new version.



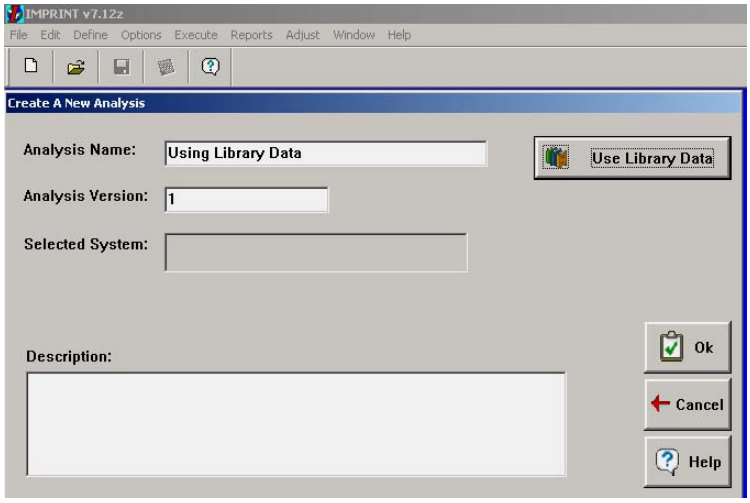
This does not open the analysis. You must select "File/Open" on the menu bar or use the "Open"  button.



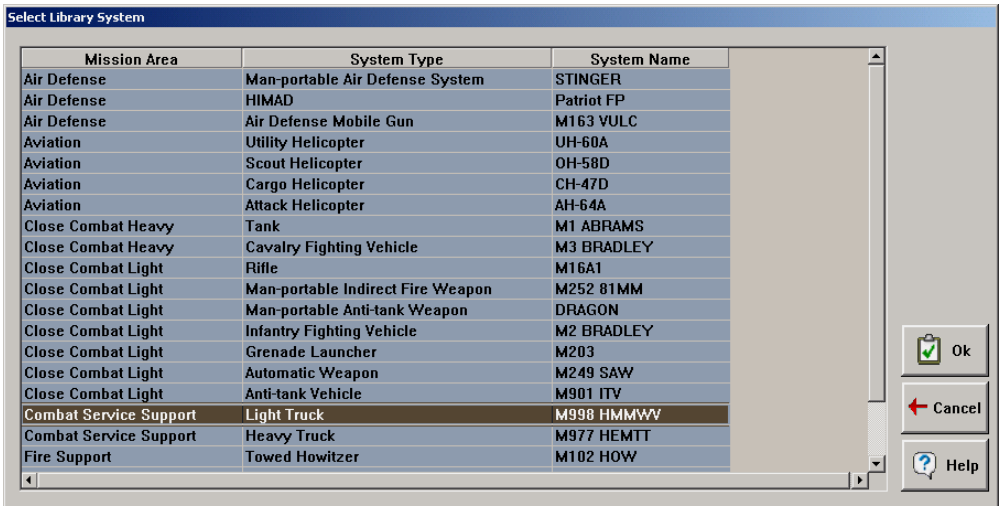
Using Library Data

To use library data the process is the same as creating a new analysis. The difference will be that you will select "Use Library Data"

******Note:*** You can enter the "Analysis Name" and "Analysis Version" before or after you select "Use Library Data…"



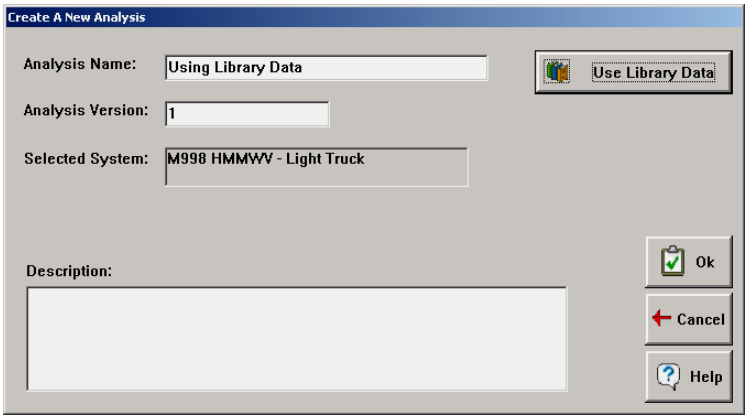
On the Select Library System screen select the system you want to modify.
You are not modifying the library data. IMPRINT will make a copy of the analysis for you to use. Once you have saved it, the new analysis will appear on the Open Existing Analysis screen.



To see the complete list of IMPRINT's library systems see "IMPRINT Library Systems" on page 113.

Using Library Data

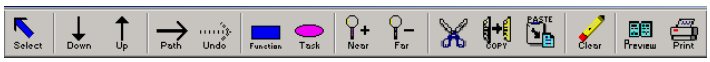
After you select the system select "OK" to get you back to the Create A New Analysis screen.



Because you selected a system stored in IMPRINT's library the "Selected System" field will be filled. This shows you the system name and system type. In this example the system name is "M998 HMMWV" and the system type is "Light Truck".

If you want to make some notes you can enter information in the "Description" field. When finished select "OK". Now you are ready to make your modifications.

When you use the library model, the network has already been created and all the data that was required when the model was originally created has been entered. You can now make the necessary modifications to update the model to meet your requirements.



Network Tool Bar

The first icon is an arrow pointing to the upper left corner of the window. This is the "select" tool. When you click on this tool, and then click on an element in the diagram, the element will be selected. Selection is indicated by the element being highlighted. It can then be deleted, copied, etc. To open a network element, use the selection tool and double click.

The next icon is the down icon, which is represented by an arrow pointing down. This tool lets you go "down" into a function and open the child function's network of tasks and functions. You cannot go "down" into a task since tasks are terminal nodes and have no networks in them. Also, you cannot go down into a START or END function.

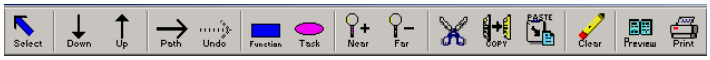
If you have gone "down" into a function, next is the up icon, which is represented by an arrow pointing up. Corresponding with the "down" tool, the "up" tool takes you to the parent function for the network currently displayed.

The "path" tool, represented by a right pointing arrow, is used to draw branches or paths between the nodes in your diagram. These nodes can be a mixture of functions and tasks. To draw a path, put the tool on the node you want to draw the path from and click. Hold the mouse button down while you drag the cursor to the node you want to draw the path to and then release the mouse button. If you draw more than one path from the same node, a decision diamond will automatically appear on your network diagram. Use the "select" tool and double click on the decision diamond to specify the branching logic associated with the multiple paths. (See "Decision Symbols" (page 108) for further explanation) Double clicking draws a path back to the current task.

To delete a path on your diagram, use the "undo" tool. The undo icon appears as a right pointing arrow that is made up of dotted lines. Follow the same procedure as with the "path" tool, and re-trace the path you want to erase. To erase a path that goes back to the same function/task, double click on that function/tasks.

The "function" tool, a rectangular icon, will add a function to your network. Just place the tool on the diagram at the place that you want the new rectangular function to be placed and click once. IMPRINT will not let you place a function on top of another network element.

The "task" tool, an oval shaped icon, works similarly to the function tool. Place the tool on the diagram at the place that you want to new task to occupy and click once. IMPRINT will not let you place a task on top of another network element.



The magnifying glass with a "+" sign and 

the magnifying glass with a "–" sign, let you zoom in and out of the network diagram. Select the tool and click on the network diagram. It will zoom in and out of the diagram view, letting you see more or less detail as it zooms.

The next four icons represent edit functions.

The first tool, scissors, is used to "cut" a highlighted function or task and place it on the clipboard. It can then be pasted to another area of the network.

The second tool, shown as two documents with an arrow between them, is used to "copy" a highlighted function or task and to put a copy on the clipboard so that it can be pasted elsewhere in your network.

The third tool is the "paste" tool, and is used to copy the data currently on the clipboard to the current cursor position.

The fourth tool, shown as a pencil eraser, is used to "clear" a network function or task. Data that are "cleared" cannot be pasted elsewhere in a network.

The final two tools are print functions.

The first tool, shown as two pages side by side, allows you to "preview" your network and along with "File/Print Setup" change your page orientation to landscape and reduce the size by going to the Graphics tab and reducing the Scaling %. However, you cannot access "File/Print Setup" while in "preview". Use "preview" to check if the page layout is satisfactory. If not, then close "preview" and then select "File/Print Setup" to make the necessary changes. Go back to "preview" to ensure the page is the way you want it.

The second tool, shown as a printer allows you to "print" your diagram.

Decision Symbols

Probabilistic  ***Repeat***  ***Multiple*** 

Whenever you draw a path to more than one node you will get a "Probabilistic" symbol. If this is a "Probabilistic" node double click on the symbol and enter the probability for the functions/tasks that appear in the list on the Function/Task Branching Logic screen.

To create a "Repeat" node use the path tool:

(1) Draw your path to where you want the path to end when the function/task completes.
(2) Click on the node you want repeated; you will see the path come back to that node.
(3) Double-click on the "Repeat" symbol and enter the appropriate information on the Function/Task Branching Logic screen.

If you click within the node first and then draw your path to the other node you will see a "Probabilistic" symbol. That's ok, you can change it to a "Repeat" node.
To change the symbol to "Repeat", double click on the "Probabilistic" symbol and select "Repeating" on the Function Branching Logic screen and enter the appropriate information.

To change a "Probabilistic" node to a "Multiple" node double click on the "Probabilistic" symbol and select "Multiple" on the Function/Task Branching Logic screen. Then from the drop down menu select the node where your functions/tasks will rejoin.

PTS Impact on Tasks

Define System Mission

When you apply **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors to your tasks, depending on the taxons associated with the tasks, not all tasks will be affected by **P**/**T**/**S**.

Below are tables that show which taxons are affected when you apply **P**/**T**/**S**. Because there are no entries for Time and/or Accuracy for some of these taxons, does not mean that there is no affect. What it does mean is there is no literature that could be found to validate a change.

T – Affect task time **A** – Affects task accuracy **T/A** – Affect both

P*ersonnel Characteristics*	
Increase/decrease of ASVAB affects the following TAXONS:	
Visual	**A**
Numerical Analysis	**T/A**
Information Processing	**T/A**
Fine Motor – Discrete	**T/A**
Fine Motor – Continuous	
Gross Motor – Light	**A**
Gross Motor –Heavy	
Commo (Reading & Writing)	**T/A**
Commo (Oral)	**A**

T*raining Frequency*	**TAXONS**		
	Numerical	**Fine Motor – Discrete**	**Reading & Writing**
Less than twice a year	**T/A**	**A**	**T/A**
Less than once a month	**T/A**	**A**	**T/A**
Once a month (Default)	**T/A**	**A**	**T/A**
2 or 3 times a month	**T/A**	**A**	**T/A**
Once a week or more	**T/A**	**A**	**T/A**

PTS Impact on Tasks by Taxons

TAXONS	**S***tressors*				
	MOPP	**Heat**	**Cold**	**Noise**	**Sleepless Hours**
Visual	**T**	**A**	**T**		
Numerical Analysis		**A**			**T/A**
Cognitive Processing		**A**			**T/A**
Fine Motor - Discrete	**T**	**A**	**T**		
Fine Motor - Continuous					
Gross Motor - Light	**T**		**T**		
Gross Motor - Heavy					
Commo (Read & Write)		**A**			
Commo (Oral)	**T**	**A**		**A**	

Define Equipment Taxons

When you apply **P**ersonnel Characteristics/**S**tressors to your tasks, depending on the taxons associated with the tasks, not all tasks are affected by **P**/**S**.

Below is a table that shows which taxons affect which maintenance tasks when you apply **P**/**S**. The taxons affect time only. When applied, the MTTR (mean time to repair) will change. At this time, there are no reliable data to show how "Training Frequency" is affected.

Taxon	***Repair Tasks***
Visual Fine Motor Discrete	Adjust & Repair
Visual Information Processing	Inspect
Visual Fine Motor Discrete	Remove & Replace
Visual Information Processing	Test & Check
Visual Information Processing	Trouble Shoot

Mapping Workload to Taxons

(Define System Mission only)

Mental Workload Ratings	**Taxons**
Visual 1.0, 3.7, 4.0, 5.0, 5.4, 7.0	Visual (Pattern Recognition-Discrimination
Cognitive 7.0	Numerical
Cognitive 1.0, 1.2, 3.7, 4.6, 5.3, 6.8	Information Processing
Psychomotor 2.2, 4.6, 5.8, 7.0	Fine Motor Discrete
Psychomotor 2.6	Fine Motor Continuous
---	Gross Motor Light
---	Gross Motor Heavy
Auditory 4.9, 6.6, 7.0 ***Psychomotor*** 1.0	Communications (Oral)
Visual 5.9 ***Psychomotor*** 6.5	Communications (Read & Write)
Auditory 1.0, 2.0, 4.2, 4.3	---

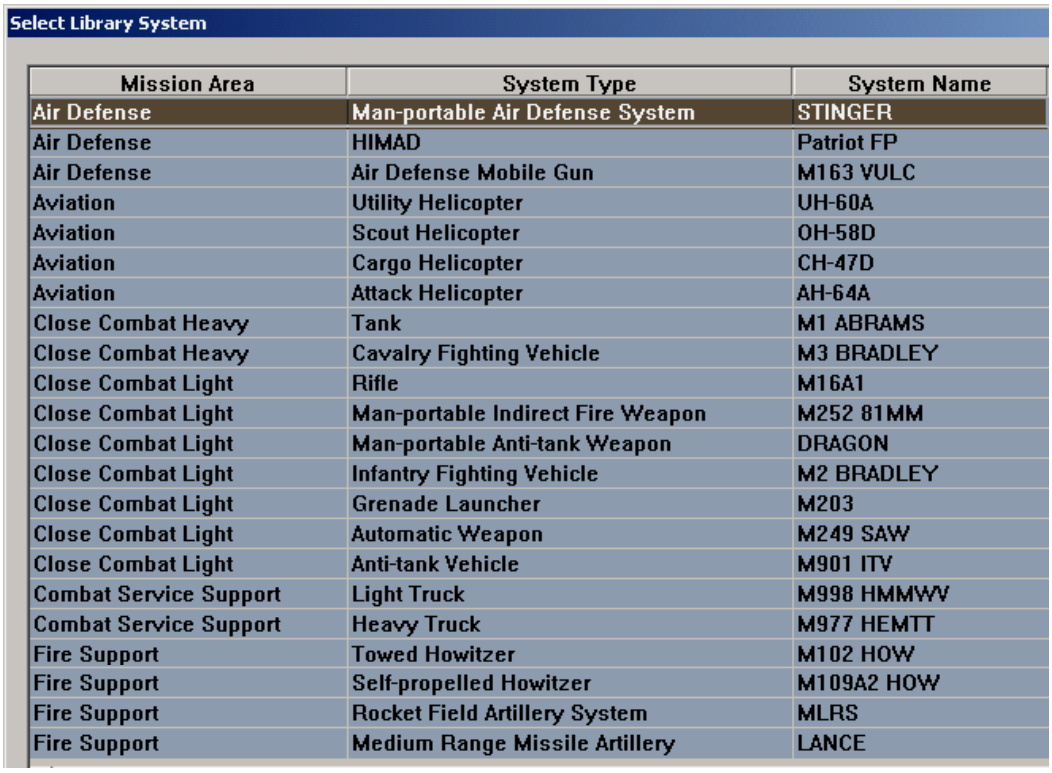
******Note*** : None of the VACP workload scores map into either Gross Motor Light or Gross Motor Heavy taxons because workload channels are primarily mental

Define Equipment Exercise Data Sheet

Subsystem	*EquipGrp*	*Component*	*MaintType*	*Action*	*Org Level*	*DS*	*Mos1*	*Grade*	*#Mos1*	*MOUBF*	*MTTR(Hrs)*	*SD MTTR(hrs)*	*Abort%*
Armament	***Armament***	**Ejector Chute**	Preventive	*Adjust & Repair*	DS	Off	45G	10	1	150.00	00:01:30.00	00:00:00.00	0.00
			Corrective	*Remove & Replace*	Org	On	63E	10	1	150.00	00:01:30.00	00:00:00.00	0.00
		Ammo Chute	Corrective	*Remove & Replace*	Org	On	45K	10	1	100.00	00:02:00.00	00:00:00.00	0.00
			Preventive	*Trouble Shoot*	DS	Off	63E	10	1	100.00	00:02:00.00	00:00:00.00	0.00
		Recoil Mechanism	Corrective	*Adjust & Repair*	DS	Off	45K	10	1	11984.00	00:02:10.80	00:00:00.00	0.00
			Corrective	*Remove & Replace*	Org	On	45G	10	1	5136.00	00:00:49.20	00:00:00.00	0.00
		Barrel Assembly	Preventive	*Adjust & Repair*	Org	On	63E	10	1	300.00	00:00:36.60	00:00:00.00	0.00
			Corrective	*Remove & Replace*	Org	On	45K	10	1	300.00	00:00:36.60	00:00:00.00	0.00
Communication	***Other***	**Rec/Trans**	Corrective	*Adjust & Repair*	DS	Off	63E	10	1	679.00	00:01:13.80	00:00:00.00	0.00
			Preventive	*Remove & Replace*	Org	On	45K	10	1	679.00	00:01:04.80	00:00:00.00	0.00
		AM 1780 VRC	Preventive	*Adjust & Repair*	DS	Off	63E	10	1	611.00	00:02:15.00	00:00:00.00	0.00
			Preventive	*Remove & Replace*	Org	On	63E	10	1	203.00	00:01:45.00	00:00:00.00	0.00
		Communications	Preventive	*Adjust & Repair*	Org	On	63E	10	1	763.00	00:01:14.40	00:00:00.00	0.00
			Corrective	*Inspect*	Org	On	45G	10	1	763.00	00:01:14.40	00:00:00.00	0.00
Engine	***Mobility***	**Starter**	Corrective	*Adjust & Repair*	DS	Off	45G	10	1	851.00	00:01:48.00	00:00:00.00	50.00
			Preventive	*Remove & Replace*	Org	On	63E	10	1	1250.00	00:02:00.00	00:00:00.00	50.00
		Fuel Pump	Preventive	*Adjust & Repair*	DS	Off	63E	10	1	1893.00	00:10:24.00	00:00:00.00	100.00
			Preventive	*Inspect*	DS	Off	45K	10	1	1893.00	00:05:30.00	00:00:00.00	100.00
		Engine, Other	Preventive	*Inspect*	Org	On	63E	10	1	198.00	00:01:00.00	00:00:00.00	80.00
			Corrective	*Remove & Replace*	Org	On	45K	10	1	198.00	00:02:33.00	00:00:00.00	80.00

IMPRINT Library Systems

The library systems available in IMPRINT:



Mission Area	System Type	System Name
Air Defense	Man-portable Air Defense System	STINGER
Air Defense	HIMAD	Patriot FP
Air Defense	Air Defense Mobile Gun	M163 VULC
Aviation	Utility Helicopter	UH-60A
Aviation	Scout Helicopter	OH-58D
Aviation	Cargo Helicopter	CH-47D
Aviation	Attack Helicopter	AH-64A
Close Combat Heavy	Tank	M1 ABRAMS
Close Combat Heavy	Cavalry Fighting Vehicle	M3 BRADLEY
Close Combat Light	Rifle	M16A1
Close Combat Light	Man-portable Indirect Fire Weapon	M252 81MM
Close Combat Light	Man-portable Anti-tank Weapon	DRAGON
Close Combat Light	Infantry Fighting Vehicle	M2 BRADLEY
Close Combat Light	Grenade Launcher	M203
Close Combat Light	Automatic Weapon	M249 SAW
Close Combat Light	Anti-tank Vehicle	M901 ITV
Combat Service Support	Light Truck	M998 HMMWV
Combat Service Support	Heavy Truck	M977 HEMTT
Fire Support	Towed Howitzer	M102 HOW
Fire Support	Self-propelled Howitzer	M109A2 HOW
Fire Support	Rocket Field Artillery System	MLRS
Fire Support	Medium Range Missile Artillery	LANCE